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electron user

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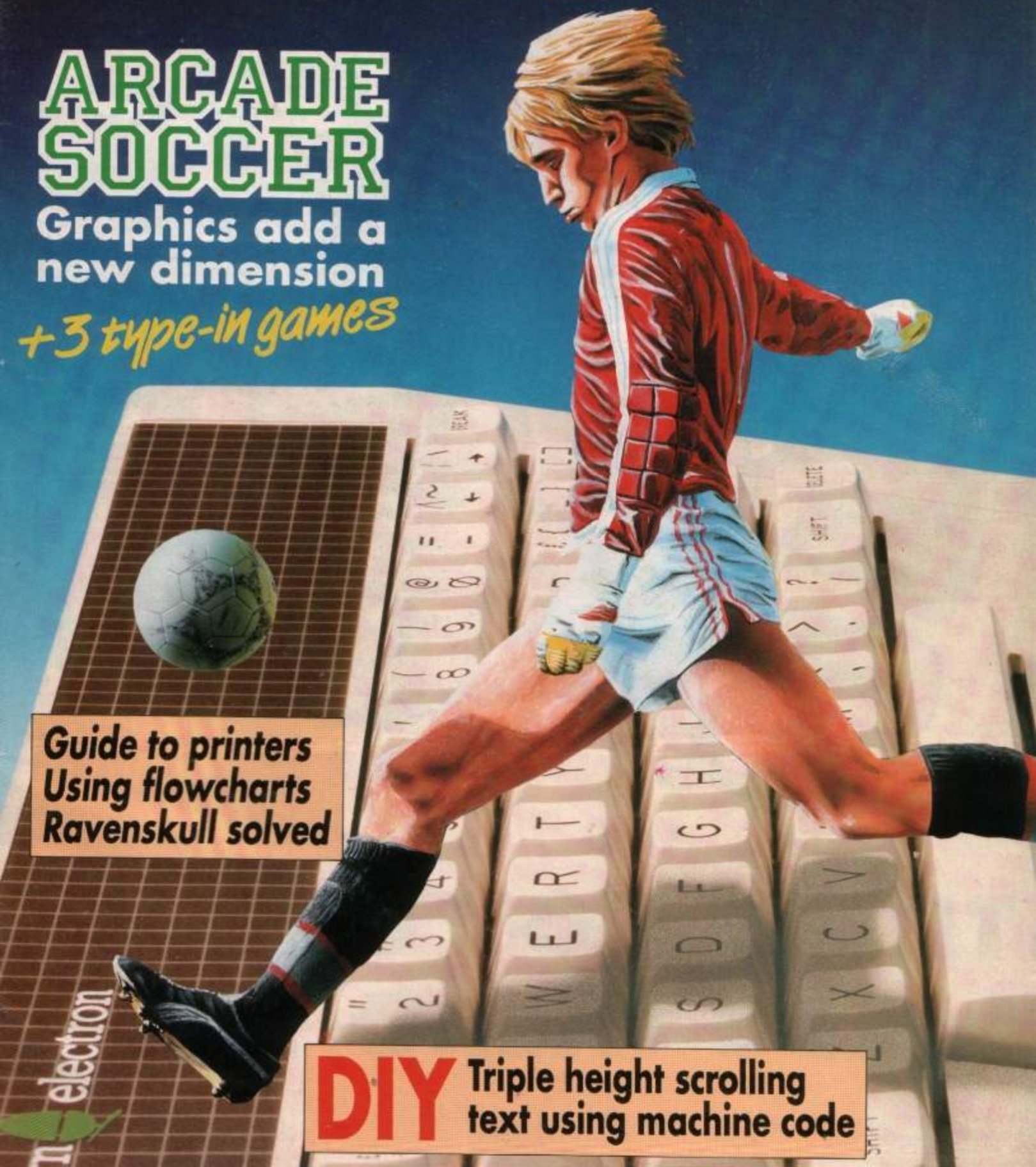

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Back to school
10 educational games for the Electron for just £5.95
Order on Page 46

electron user NEWS

Add-ons boost for Electron

ELECTRONICS engineer John Wike has produced two new add-ons to increase the power and BBC compatibility of the Electron through his company Jafa Systems (0222 887203).

Designed to fill a two year gap in the market, his RS423 cartridge plugs into the Plus 1 slot and is driven by the software in the Plus 1. The connector is similar to that in the BBC Micro so compatibility with serial peripherals such as modems and printers is assured.

The cartridge also contains a 28 pin socket to take 8k or 16k eproms or a 32K ram configured as two sideways slots. The ram is protected against rom software which tries to corrupt itself, such as View.

The protection can be switched out to allow sideways ram based software such as Pres ADFS E00 to be used.

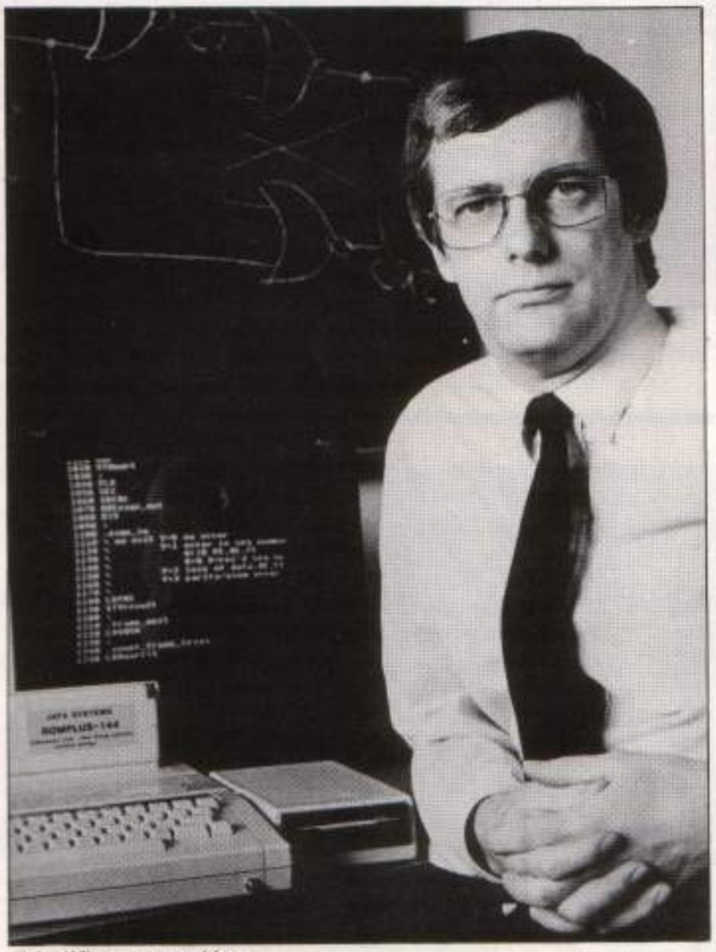
Opening up wider possibilities for Electron users wanting to get into comms, the board costs £29.95 uncased. A case is available for £5 and a 32k ram device costs £20.

Due soon from Jafa is a Mode 7 Mark 2 unit which has been upgraded to be cheaper and more compact than its original Mode 7 adaptor, making many more BBC programs available to Electron users.

Although it retains the display chip used in the BBC Micro to give rounded teletext style characters, it dispenses with the scanning circuitry, giving a much smaller board which fits into the Electron above the ULA.

Scanning is performed by the ULA set in Mode 4 in a similar way to the simulator using Mode 2. This increases speed and uses much less memory than the simulator. Once again, the memory used is in shadow ram if the Slogger Master Ram board is used giving HIMEM at &7C00 with that board.

A rom expansion system is needed to hold the operating system eprom which also contains Prestel terminal software and a demonstration of the screen editor/carousel program which is available separately.



John Wike . . . new add-ons

Costing £49, the unit is designed to be easily soldered in place, but a fitting service will be available for £10. Alternatively, a kit including board, eprom and instructions will cost £25. The Mode 7 simulator package is still available.

A share in Wordpower

FIVE years after its release, word processing package for the Acorn range Wordpower has been made available as shareware by Ian Copestake Software (051-648 6287).

For £5 you receive a full working copy of Wordpower complete with documentation. Those who like the program can become registered users by paying the rest of the purchase price. Anyone who is not convinced can keep the package anyway or give it to someone else to try.

If the goods are returned in perfect condition within two months, the £5 is refunded, less postage costs.

"Now everyone can test our claim that Wordpower is the best in its class", said Ian Copestake. "While Wordpower shareware can be obtained almost free, it is still protected by copyright laws. Those who become satisfied users are trusted to register and obtain any site licence which may be required. Failure to do so would just reduce the chance of other software being released in this way".

Anyone requesting the shareware is asked to send details of their computer. Ian Copestake Software is based at 10 Frost Drive, Wirral, Merseyside, L61 4XL.

A super Sam from Superior

SUPERIOR Software (0532 459453) is poised to release what partner Steve Hanson believes could be the best Sam yet. Play it Again Sam 11 is certainly an impressive compilation and is aimed at a late October, early November release. It leads off with the ever popular Barbarian.

In November, *Electron User* gave the second title, Pipeline, 10 out of 10 in every review category. It was described as "a masterpiece of brain twisting entertainment" containing the best of both Repton and Ravenskull.

With 133 screens, third title Baron is a massive arcade adventure from new writer Angelo Sparacino. The Superior men were so impressed by its scope that they were tempted to a single, full-price release before opting for compilation.

The line-up for this latest Sam offering is completed with the evergreen Acornsoft favourite Monsters and the compilation will sell for the usual Electron price of £9.95.

Also due from Superior at the end of October is full-price release Ricochet. A Ravenskull type game, it is a huge arcade adventure with four levels and 100 screens on each. The hero is a bouncing ball which jumps according to how much it is depressed. Aggravating until you get the hang of it, but addictive when you do. It will sell for £9.95.

Sharp look for monitors

A REAL space-age anti-glare VDU screen has been launched by Data Sound (01-883 6421).

The Olympus Tipo is made from glass specially designed for the space shuttle programme. Fixed on to the monitor with adhesive material it is designed to give a sharper image and costs £89.

SOFTWARE Bargains

To operate a joystick from the Electron, you will require an interface of some sort. We supply a single unit Commander 3 interface, which will take most 'Atari-Type' joysticks, is with a Spin 'D' connecting plug. The PLUS 1 interface as well as having 2 ROM cartridge slots, & printer port, also has in-built, an analogue joystick interface, compatible only with joysticks with a 15 pin 'D' connecting plug.

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ACORNSOFT HITS 2 (Starship Command, Arcadians, Snooker, Meteors)	C	9.95	4.95
MICRO POWER MAGIC 1 (Stock Car, Felix Evil Weevils, Esc. Moonbase, Swag, Chess, Bandits at 3, Galactic Commander, Adventure, Cybertron Mission, European Knowledge)	C	7.95	5.75
MICRO POWER MAGIC 2 (Bumble Bee, Gauntlet, Rubble Trouble, The Mine, Frenzy, Felix Fruit, Danger UXB, Swoop, Positron, Killer Gorilla)		7.95	5.75
PLAY IT AGAIN SAM (Citadel, Thrust, Strykers Run, Ravenskull)	C	9.95	6.95
PLAY IT AGAIN SAM 2 (Repton 3, Crazee Rider, Galaforce, Codename Droid)	C	9.95	6.95
PLAY IT AGAIN SAM 3 (Commando, Palace of Magic, K. Gorilla, K. Gorilla 2)	C	9.95	6.95
PLAY IT AGAIN SAM 4 (Frak, Spellbinder, Cosmic Camouflage, Guardian)	C	9.95	6.95
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PLAY IT AGAIN SAM 9 (Camelot, Steve Davis Snooker, Spycat, Life of Repton)		9.95	6.95
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GRAPHICS Part of the spreadsheet section, it lets you draw bar charts, pie charts & histograms to give a graphic presentation of your statistics. Helps to give life & colour to the dullest figures!

fun school 2

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Cybertron Mission	Snapper	Chess (Micro Power)	The Mine	Where?	Talkback
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Here's what you'll find in the April 1989 – September 1989 bundle:

May 1989 issue:
Games: Eliminator. *Utilities:* EZ Type, DFS disc formatter. *Features:* Tournament sorts, Party Cocktail Creator, Landscape Designer, Fractal Generator. *Reviews:* Barbarian II, Circus Games, Superman, Mode 7 Simulator Rom.

June 1989 issue:
Games: Tic Tac Rhymes, Duel. *Features:* ADFS osword calls explained, creating customised tapes, maps to Woodbury End and Palace of Magic. *Utilities:* Disc-based database, new CIRCLE graphics command, Morse Code Tutor. *Reviews:* Holed Out, Tank Attack, Sam 7.

July 1989 issue:
Games: Jet Bike arcade adventure, educational fun with Ladder Adder, Time bomb arcade fun. *Utilities:* Speedy Reader. *Reviews:* Predator, Stormcycle, Sam 8. *Features:* Jafa Systems interview, Disc error codes documented, 10 Liners, Philosophers Quest and Palace of Magic mapped.

August 1989 issue:
Games: Rollerball, Bingo. *Reviews:* Alps, Turtle Worlds, White Magic, Play it Again Sam 9. *Features:* Map of Kayleth, Repton Infinity tips. *Utilities:* Disc Housekeeper, Mode 2 screen compacter, Titration, Chemical Equations.

September 1989 issue:
Game: Snakes. *Reviews:* Keyword, Basic Editor Plus, Ballistix, Sam 10. *Features:* Arcade Corner, Electron history. *Utilities:* Attribute editor, magazine database.

October 1989 issue:
Game: Spinning frustration, Jet Bike, Robokill. *Reviews:* Rodeo Games, Hi Q Quiz, Spooksville, Rombard. *Features:* Exile solution, Electron carrying case. *Utilities:* Elkpaint, Disc Menu.

electron user

BACK ISSUE BUNDLE

Everything you ever wanted to know about your Electron but were afraid to ask is in these back issues of Electron User

Only £1.50 each or £7.99 for all six

TO ORDER PLEASE USE THE FORM ON PAGE 45

The yolk's on the hawks and hedgehogs when you pelt them with eggs in Stuart Bain's arcade type-in

Storker's run

STORKER is the champion bird-brain of the stork village, and so it is his duty to protect it from evil forces attempting to conquer the land. The hedgehogs dislike the storks and have banded together with deadly hawks in an all out attack on the village. So you quickly leap to its defence.

This is Storker's most dangerous mission. An endless army of hedgehogs is advancing on the ground while the hawks patrol the air. Watch out for the hedgehogs' spines, as they drain your energy, and the hawks try to drop egg bombs on you as they fly past. Luckily, Storker is equipped with his own supply of egg grenades, able to stop both hedgehogs and bombs.

You start the game on the left-hand side of the screen and the hawks and hedgehogs attack from the right. You must dodge the hawk egg-bombs and dispose of the hedgehogs with your own eggy grenades.

To complete each screen, Storker must catch bugs which buzz overhead. The number to eat is shown at the top of the screen. Once Storker has had his fill he must run to the right-hand edge of the screen.

Touching hedgehogs or being hit by bombs weakens him – his strength is shown at the top of the screen. A bonus will be awarded depending on the amount of strength left.

CONTROLS	
Z	Left
X	Right
Return	Jump
Space	Throw grenade

```
   10REM Storker's Run
   20REM By Stuart Bain
   30REM (c) Electron User
   40PROCinit
   50ONERRORIFERR<>17MODE6:PRINT:
REPORT:PRINT" at line ";ERL:OSCLI
"FX21":END
   60REPEATMODE4:VDU23,1;0;0;0;0;
19,0,4;0;:PROCstart
   70MODE5:VDU23,1,0;0;0;0;19,1,5
;0;17,2:PROCvar
   80REPEATPROCscreen:CALLmain%
   90IF?dead=200PROCclear ELSEPRO
Cdead
  100UNTIL?dead:PROCover
  110MODE4:VDU23,1,0;0;0;0;19,0,4
;0;:PROChigh:UNTILO
  120DEFPROCstart
  130A%=0:B%=0:C%=1:*FX210,0
  140REPEATIFB%PROCtable ELSEPROC
options
  150REPEATTIME=0:REPEATA%=0:IFIN
KEY-99A%=100ELSEIFINKEY-38A%=1ELS
EIFINKEY-17A%=2ELSEIFINKEY-82A%=3
  160UNTILA%ORTIME>700
  170IFA%=0B%=1-B%:UNTIL1:UNTILO
  180IFA%=1PROCinstr
  190IFA%=2C%=0:OSCLI"FX210,1":IF
B%=0PROCdb("on",11,13):PROCdb("OF
F",30,13):UNTILO
  200IFA%=3C%=1:OSCLI"FX210,0":IF
B%=0PROCdb("ON",11,13):PROCdb("of
f",30,13):UNTILO
  210IFA%=20RA%=3UNTILO
  220UNTIL1:UNTILA%=100
  230PROCtune("CCCECEEEGEGGGIDDDD
G","4448844488444874448"):REPEATU
NTILADVAL(-6)=15
  240ENDPROC
  250DEFPROCoptions
  260PROCheader:PROCwindow(3,6,34
,25)
  270PROCdb("CONTROLS",13,1):PROC
db("Z - left.............X - ri
ght",1,4):PROCdb("Space - grenade
....Return - jump",1,7)
  280PROCdb("P - pause on.......0
 - pause off",1,10):IFC%PROCdb("S
 - sound ON.......Q - sound off",
1,13)ELSEPROCdb("S - sound on....
...Q - sound OFF",1,13)
  290PROCdb("Escape - abort",10,1
6)
  300PROCdb("Press 'I' for instru
ctions",4,19):PROCdb("Press Space
 to start",7,22)
  310ENDPROC
  320DEFPROCinstr
  330PROCheader:PROCwindow(1,8,38
,16):PRINTTAB(11,1)"The Story so
far"TAB(11,2)"----------------"
  340PROCsplit("Storker is the ch
ampion chosen by his village,and
he must protect it from the evil
forces attempting to conquer the
land. The dreaded giant hedgehogs
 have banded with the deadly hawk
s in an all out attack.")
  350PROCspace:PROCheader:PROCwin
dow(1,7,38,17)
```

Turn to Page 10 ▶

◀ *From Page 9*

```
  360PROCsplit("Storker has been assigned an egg-stremely dangerous mission. There is an endless army of hedgehogs advancing whilst the hawk air patrols drop egg-bombs.")
  370PROCsplit("However, Storker is equipped with egg-grenades, able to take out both the hedgehogs and the bombs.")
  380PROCspace:PROCheader:PROCwindow(1,6,38,19)
  390PROCsplit("To clear each screen, Storker must catch the required number of bugs which buzz overhead. Then he must run to the right edge of the screen.")
  400PROCsplit("Touching hedgehogs or being hit by bombs weakens Storker. His strength is shown at the top. On completion of a sheet, a bonus will be awarded depending on the strength left.")
  410PROCspace:ENDPROC
  420DEFPROCvar
  430S%=0:li%=2:lev%=1:?sp=244
  440COLOUR2:PRINTTAB(0,27)STRING$(20,CHR$224)TAB(0,7)STRING$(20,CHR$224)
  450GCOL0,1:MOVE0,136:VDU5:PRINTSTRING$(100,CHR$226):MOVE0,136:GCOL0,2:PRINTSTRING$(100,CHR$227)
  460$&110="Storker's  Run":GCOL0,0:VDU5:MOVE192,96:CALLdoub%:MOVE200,92:CALLdoub%:MOVE192,88:CALLdoub%:MOVE184,92:CALLdoub%:GCOL0,3:MOVE192,92:CALLdoub%:VDU4
  470X%=28:Y%=1:CALLcalc%:!data=men%:X%=3:Y%=24:CALLprint%
  480PRINTTAB(0,1)"SCORE LEV:"TAB(6,3)"EAT:"TAB(16,2)"="
  490ENDPROC
  500DEFPROCscreen
  510!gx=0:!ju=0:!hit=0:!time%=&285F80:!fx=0
  520!add=&7600:!data=men%:X%=3:Y%=24:CALLprint%:W%=0:I%=24
  530COLOUR1:VDU31,0,5,225,225,225:COLOUR2:PRINT;STRING$(17,CHR$225):COLOUR3
  540!bon=0:!hx=&131C24:RESTORE630:FORI%=0TO(lev%-1)MOD10:READA$:NEXT
  550?htot=VALMID$(A$,1,1)-1:?btot=VALMID$(A$,2,1)
  560F%=VALMID$(A$,3,1):?tdec=VALMID$(A$,4)
  570FORI%=0TO?htot:?tx=hx?I%:CALLhogpr:NEXT
  580?haw=18:CALLhawpr
  590PRINTTAB(10,1);SPC-(lev%<10);lev%TAB(11,3);F%TAB(18,2);li%TAB(0,3);RIGHT$("0000"+STR$S%,5)
  600PROCdb("READY!",7,16):PROCdel(100):PROCdb("      ",7,16):SOUND1,-15,80,2
  610X%=0:Y%=24:!old=men%:?ti=?sp
  620ENDPROC
  630DATA11105,12105,12206,12307,23208,22308,22408,32209,23410,33411
  640DEFPROCclear
  650PROCtune("NNNNPPPPRPRPNNNN","6337633755553338"):PROCdel(100)
  660?dead=0:IFtime%?2=0GOTO680ELSEX%=0:Y%=3:A%=0:REPEATCALLbonus:*FX21,5
  670SOUND1,-15,150,1:S%=S%+5:!nu=S%:CALLnumb%:PROCdel(10):UNTIL?dead:?dead=0
  680CALLcle%:lev%=lev%+1:IF(lev%-1)MOD10=0:?sp=?sp-2*(?sp<254)
  690COLOUR2:PRINTTAB(2,13)"Proceed to level":COLOUR3:PROCdb(STR$lev%,9,15)
  700IF(lev%-1)MOD5=0PROCdel(100):PRINTTAB(5,19)"BONUS LIFE":SOUND1,-1,200,4:li%=li%+1:PRINTTAB(18,2);li%
  710PROCdel(200):CALLcle%
  720ENDPROC
  730DEFPROCdead
  740FORI%=0TO15:Y%=Y%-1+2*(I%MOD2):CALLbird%:SOUND0,-15,5-I%MOD2,2:PROCdel(10):NEXT
  750PROCdel(60):PROCtune("HIHfED","6453556")
  760li%=li%-1:IFli%:?dead=0
  770PROCdel(200):CALLcle%:PROCdel(60):ENDPROC
  780DEFPROCover
  790FORI%=1TO10:PROCdb(MID$("GAME  OVER",I%,1),4+I%,14):PROCdel(25):NEXT
  800PROCtune("EEEEGffEEdE","9739 7355739")
  810PROCdel(200):CALLcle%:ENDPROC
  820DEFPROChigh
  830IFS%<=hs%(4)GOTO910
  840I%=-1:REPEATI%=I%+1:UNTILS%>hs%(I%):FORJ%=3TOI%STEP-1:hs%(J%+1)=hs%(J%):hi$(J%+1)=hi$(J%):NEXT:hs%(I%)=S%:hi$(I%)=""
  850PROCtable:PROCwindow(8,26,24,4):PROCdb("Please enter your name",1,1):VDU28,5,25,33,7
  860*FX21
  870A$="":REPEATB%=GET:IFB%>31ANDB%<127ANDLEN(A$)<10A$=A$+CHR$B%
  880IFB%=127A$=LEFT$(A$,LEN(A$)-1)
  890PROCdb(LEFT$(A$+" ",10),19,I%*3+1):UNTILB%=13
  900hi$(I%)=A$
  910PROCtable
  920PROCspace:ENDPROC
  930DEFPROCtable
  940CALLscr%:PROCwindow(8,1,24,4):PROCdb("Storker's  famous-Five",1,1)
  950PROCwindow(5,7,30,16):FORJ%=0TO4:PROCdb(RIGHT$("00000"+STR$hs%(J%),5)+".............."+hi$(J%),1,1+J%*3):NEXT
  960ENDPROC
  970DEFPROCtune(A$,B$)
  980C$=" CcDdEFfGfHhIJjKkLMmNnOoPQqRrSTtUu"
  990FORI%=1TOLENA$:SOUND1,4,INSTR(C$,MID$(A$,I%,1))*4,VALMID$(B$,I%,1):SOUND1,0,0,0:NEXT
  1000ENDPROC
  1010DEFPROCsplit(A$)REPEATI%=37:REPEATI%=I%-1:UNTILMID$(A$,I%,1)=" ":J%=I%:REPEATI%=I%-1:UNTILMID$(A$,I%,1)<>" ":PROCcent(LEFT$(A$,I%)):A$=MID$(A$,J%+1):UNTILLENA$<37:PROCcent(A$):ENDPROC
  1020DEFPROCcent(B$)PRINTTAB(19-LEN(B$)/2,VPOS+1);B$:ENDPROC
  1030DEFPROCwindow(X%,Y%,H%,V%)VDU28,X%,Y%+V%-1,X%+H%-1,Y%,12
  1040MOVEX%*32+4,1019-Y%*32:PLOT1,H%*32-12,0:PLOT1,0,-V%*32+12:PLOT1,-H%*32+12,0:PLOT1,0,V%*32-12
  1050PLOT0,4,0:PLOT1,0,-V%*32+12:PLOT0,H%*32-20,0:PLOT1,0,V%*32-12
  1060ENDPROC
  1070DEFPROCdb($&110,X%,Y%)CALLdoub%:ENDPROC
  1080DEFPROCdel(A%):TIME=0:REPEATUNTILTIME>A%:ENDPROC
  1090DEFPROCspace:PROCwindow(13,27,14,4):PROCdb("PRESS  SPACE",1,1):REPEATUNTILINKEY-99:ENDPROC
  1100DEFPROCheader:CALLscr%:PROCwindow(12,1,16,4):PROCdb("STORKER'S  RUN",1,1):ENDPROC
  1110DEFPROCinit
  1120VDU23,224,0,240,255,255,255,255,0,0,23,225,102,102,102,102,102,102,102,102
  1130VDU23,226,85,170,85,170,85,170,85,170,85,170,23,227,170,85,170,85,170,85,170
  1140ENVELOPE1,1,0,0,5,0,5,20,126,0,0,-126,126,126:ENVELOPE2,1,0,10,-10,0,10,10,126,0,0,-126,126,126
  1150ENVELOPE3,2,-3,0,0,50,0,0,126,0,0,-126,126,126:ENVELOPE4,2,1,-1,0,1,1,0,126,0,0,-126,126,126
  1160D1M%1790,hs%(5),hi$(5):FORI%=0TO4:hi$(I%)="Bainy Soft":hs%(I%)=(5-I%)*1000:NEXT
  1170RESTORE2240:men%=&900:FORI%=0TO407:READmen%?I%:NEXT:egg%=men%+288:hda%=men%+304:bda%=men%+368:fly%=men%+392
  1180add=&70:data=&72:old=&74:gx=&76:gy=&77:gd=&78:gre=&79
  1190ju=&7A:go=&7B:dir=&7C:anim=&7D:hit=&7E:IFINKEY-256=1ti=&29F ELSEti=&2A0
  1200deed=&7F:got=&80:last=&81:row=&82:col=&83:hx=&84:htot=&87:hco=&88:tx=&89:haw=&8A:bx=&8B:by=&8E:bon=&91:btot=&94:bco=&95
  1210time%=&60:tco=&63:tdec=&64:fx=&65:fon=&66:fco=&67:nu=&68:sp=&6C
  1220tab=&150:FORJ%=0TO27:!(tab+J%*2)=&5800+&140*J%:NEXT
  1230FORI%=0TO2STEP2:P%=Q%
  1240COPTI%
  1250.calc%LDA#0:STAadd+1:STXadd:LDX#3:.ca2:ASLadd:ROLadd+1:DEX:BNEca2:TYA:ASLA:TAY:LDAadd:ADCtab,Y:STAadd:LDAadd+1:ADCtab+1,Y:STAadd+1:RTS
  1260.print%STXrow:STYcol:LDX#0
  1270.p2:LDY#0:.p3:LDA(data),Y:EOR(add),Y:STA(add),Y
  1280INY:CPYcol:BNEp3:CLC:LDAadd:ADC#&40:STAadd:LDAadd+1:ADC#1:STAadd+1
  1290CLC:LDAdata:ADCcol:STAdata:LDAdata+1:ADC#0:STAdata+1
  1300INX:CPXrow:BNEp2:LDXrow:LDYcol:RTS
  1310.bird%LDAold:STAdata:LDAold+1:STAdata+1:LDX&45C:LDY&468:JSRcalc%:LDX#3:LDY#24:JSRprint%
  1320LDA#men%MOD256:STAdata:LDA#men%DIV256:STAdata+1:LDAdir:BEQnpl:CLC:LDAdata:ADC#144:STAdata:LDAdata+1:ADC#0:STAdata+1
  1330.npl:LDAanim:EOR#72:STAanim:CLC:ADCdata:STAdata:LDAdata+1:ADC#0:STAdata+1
  1340LDAdata:STAold:LDAdata+1:STAold+1:LDX&460:LDY&464:STX&45C:STY&468:JSRcalc%:LDX#3:LDY#24:JSRprint%:RTS
  1350.gren%LDAgre:CMP#200:BCSexplo:LDAgre:BNEmg:LDAdir:BEQgrer
  1360LDA&460:STAgx:CLC:LDA&464:ADC#1:STAgy:LDA#1:STAgd:JMPmg1
  1370.grer:LDA&460:CLC:ADC#2:STAgx:LDA&464:ADC#1:STAgy:LDA#0:STAgd
```

```
:JMPmg1
 1380.mg:JSRgrpr:.mg1:INCgre:LDAg
re:CMP#8:BCSgdo
 1390DECgy:JMPmg2:.gdo:INCgy:.mg2
:LDAgd:BNEmgl
 1400INCgx:LDAgx:CMP#40:BEQendgre
:JMPmg3:.mgl:DECgx:LDAgx:BMIendgr
e
 1410.mg3:JSRgrpr:LDAgre:CMP#15:B
EQexplo:RTS:.endgre:LDA#0:STAgot:
STAgre:STAgx:STAgy:RTS
 1420.explo:LDAgre:CMP#200:BCSex2
:LDA#200:STAgre:JSRgrpr:JMPexpr:.
ex2:INCgre:LDAgre:CMP#202:BEQex3:
RTS:.ex3:JSRexpr:JMPendgre
 1430.expr:LDXgx:LDYgy:JSRcalc%:L
DA#(egg%+8)MOD256:STAdata:LDA#(eg
g%+8)DIV256:STAdata+1:LDX#1:LDY#8
:JMPprint%
 1440.grpr:LDXgx:LDYgy:JSRcalc%:L
DA#(egg%)MOD256:STAdata:LDA#(egg%
)DIV256:STAdata+1:LDX#1:LDY#8:JMP
print%
 1450.hogpr:CLC:LDA#hda%MOD256:ST
Adata:LDA#hda%DIV256:STAdata+1:LD
Xtx:LDY#25:JSRcalc%:LDX#2:LDY#32:
JMPprint%
 1460.hog%LDA#&FF:STAhco:.h1:INCh
co:LDYhco:LDAhx,Y:STAtx:JSRchhog:
LDAdead:BEQh2:RTS
 1470.h2:JSRhogpr:LDAtx:BEQback:L
DAhit:BNEnewhog:.h3:DECtx
 1480.h4:LDXhco:LDAtx:STAhx,X:JSR
chhog:LDAhit:BNEnewhog:JSRhogpr
 1490.h5:LDAdead:BNEh6:LDAhco:CMP
htot:BNEh1:.h6:RTS
 1500.newhog:LDAgot:BNEh3:LDA#1:S
TAgot:JSRexplo:LDX#s4 MOD256:LDY#
s4 DIV256:JSRsou
 1510CLC:LDA&44C:ADC#10:STA&44C:S
TAnu:LDA&44D:ADC#0:STA&44D:STAnu+
1:LDA#0:LDX#0:LDY#3:JSRnumb%
 1520.back:LDA#36:STAtx:JMPh4
 1530.chhog:CLC:LDA&460:ADC#2:CMP
tx:BCCch2:CLC:LDAtx:ADC#3:CMP&460
:BCCch2:LDA&464:CMP#23:BCCch2:JSR
bonus
 1540.ch2:LDA#0:STAhit:LDAgot:BNE
ch3:LDAgy:CMP#25:BCCch3:LDAgx:CMP
tx:BCCch3:CLC:LDAtx:ADC#3:CMPgx:B
CCch3:LDA#1:STAhit:.ch3:RTS
 1550.hawk%LDAhaw:CMP&460:BEQbomb
s:JSRhawpr
 1560LDAhaw:CMP&460:BCCwri:DEChaw
:DEChaw:.wri:INChaw:JSRhawpr
 1570.bombs:LDA#&FF:STAbco:.bm1:I
NCbco:LDXbco:LDAbon,X:BEQchance:J
SRbopr
 1580LDXbco:INCby,X:JSRchbom:.bm2
:LDXbco:LDAby,X:CMP#27:BNEbm3:LDA
#0:STAbon,X:JMPbm4
 1590.bm3:JSRbopr:.bm4:LDAbco:CMP
btot:BNEbm1:RTS
 1600.chance:LDA#4:STA&2A:LDA#0:S
TA&2B:STA&2C:STA&2D:JSR&AF12:LDA&
2A:CMP#1:BNEendcha
 1610LDXbco:CLC:LDAhaw:ADC#1:STAb
x,X:CMPlast:BNEch9:INCbx,X:LDAbx,
X:.ch9:STAlast:LDA#10:STAby,X:LDA
#1:STAbon,X:JMPbm3:.endcha:JMPbm4
 1620.hawpr:LDA#bda%MOD256:STAdat
a:LDA#bda%DIV256:STAdata+1:LDXhaw
:LDY#9:JSRcalc%:LDX#1:LDY#24:JMPp
rint%
 1630.bopr:LDAgx:PHA:LDAgy:PHA:LD
Abx,X:STAgx:LDAby,X:STAgy:JSRgrpr
:PLA:STAgy:PLA:STAgx:RTS
 1640.chbom:LDAbx,X:CMP&460:BCCch
b2:CLC:LDA&460:ADC#2:CMPbx,X:BCCc
hb2:LDAby,X:CMP&464:BCCchb2:CLC:L
DA&464:ADC#2:CMPby,X:BCCchb2:LDA#
```

```
0:STAbon,X:JSRbopr:JSRbonus
 1650.chb2:LDXbco:LDAgx:CMPbx,X:B
NEchb3:LDAgy:CMPby,X:BNEchb3:LDA#
0:STAbon,X:JSRbopr:JSRexplo
 1660LDX#s4 MOD256:LDY#s4 DIV256:
JSRsou:CLC:LDA&44C:ADC#200:STA&44
C:STAnu:LDA&44D:ADC#0:STA&44D:STA
nu+1:LDA#0:LDX#0:LDY#3:JSRnumb%
 1670.chb3:RTS
 1680.mvman%LDAgre:BEQv1:JSRgren%
 1690.v1:LDAju:BEQv2:JMPjump
 1700.v2:LDA#0:STAgo:LDX#&9E:JSRi
nkey:TYA:BEQv3:JSRleft:JMPv4:.v3:
LDX#&BD:JSRinkey:TYA:BEQv4:JSRrig
ht
 1710.v4:LDX#&9D:JSRinkey:TYA:BEQ
v5:LDAgre:BNEv5:LDX#s3 MOD256:LDY
#s3 DIV256:JSRsou:JSRgren%:.v5:LD
X#&B6:JSRinkey:TYA:BEQv6:LDX#s2 M
OD256:LDY#s2 DIV256:JSRsou:JSRjum
p
 1720.v6:LDAgre:BEQv7:JSRgren%:.v
7:LDA&45C:CMP&460:BNEv8:LDA&468:C
MP&464:BNEv8:RTS
 1730.v8:JMPbird%
 1740.left:LDA#1:STAgo:STAdir:LDA
&460:BEQrts:DEC&460:.rts:RTS
 1750.right:LDA#2:STAgo:LDA#0:STA
dir:LDA&460:CMP#37:BEQedge:INC&46
0:LDA&460:CMP#37:BEQedge:RTS:.edg
e:LDA&418:BNErts:LDA#200:STAdead:
RTS
 1760.inkey:LDA#&81:LDY#&FF:JMP&F
FF4
 1770.sou:LDA#7:JMP&FFF1
 1780.jump:INCju:LDAju:CMP#6:BCSj
do:DEC&464:JMPj2:.jdo:INC&464
 1790.j2:LDAju:CMP#1:BEQj3:LDAgo:
CMP#1:BEQjle:CMP#2:BEQjri:JMPj3:.
jle:JSRleft:JMPj3:.jri:JSRright
 1800.j3:LDAju:CMP#10:BNEj4:LDA#0
:STAju:.j4:JMPv6
 1810.esc:LDA#50:STAdead:RTS
 1820.pause:LDAti:STAhit:.p1:LDX#
&C9:JSRinkey:TYA:BEQp1:LDAhit:STA
ti:JMPm2
 1830.wait:BITti:BMIwait:LDAsp:ST
Ati:RTS
 1840.main%LDX#&EF:JSRinkey:TYA:B
EQsoff:LDA#210:LDX#1:LDY#0:JSR&FF
F4
 1850.soff:LDX#&AE:JSRinkey:TYA:B
EQson:LDA#210:LDX#0:LDY#0:JSR&FFF
4
 1860.son:LDX#&8F:JSRinkey:TYA:BN
Eesc
 1870LDX#&C8:JSRinkey:TYA:BNEpaus
e
 1880.m2:JSRmvman%:LDAdead:BNEend
ma:JSRhog%:LDAdead:BNEendma
 1890JSRhawk%:LDAdead:BNEendma:JS
Rbug%:LDAdead:BNEendma:JSRcount%:
LDAdead:BNEendma
 1900JSRwait:JMPmain%:.endma:RTS
 1910.endma:RTS
 1920.bug%LDAfon:BNEbmv:INCfco:LD
Afco:CMP#30:BNEbgnd:LDA#0:STAfco:
LDA&418:BEQbgnd:LDA#1:STAfon:LDA#
39:STAfx:JMPbmv2:.bgnd:RTS
 1930.bmv:JSRfpr:.bmv2:JSRfch:BNE
fend:LDAfx:BEQfend:DECfx:JSRfch:B
NEfend:JSRfpr:RTS:.fend:LDA#0:STA
fon:RTS
 1940.fch:LDA&464:CMP#19:BNEfch2:
CLC:LDA&460:ADC#2:CMPfx:BCCfch2:C
LC:LDAfx:ADC#1:CMP&460:BCCfch2
 1950.fgt:LDX#s1 MOD256:LDY#s1 DI
V256:JSRsou:DEC&418:LDA&418:STAnu
:LDA#0:STAnu+1:LDA#4:LDX#11:LDY#3
:JSRnumb
 1960CLC:LDA&44C:ADC#50:STA&44C:S
TAnu:LDA&44D:ADC#0:STA&44D:STAnu+
1:LDA#0:LDX#0:LDY#3:JSRnumb%
 1970CLC:LDAtime%+2:ADC#3:STAtime
%+2:LDAtime%:ADC#24:STAtime%:LDAt
ime%+1:ADC#0:STAtime%+1:LDA#1:RTS
 1980.fch2:LDA#0:RTS
 1990.fpr:LDA#fly%MOD256:STAdata:
LDA#fly%DIV256:STAdata+1:LDXfx:LD
Y#19:JSRcalc%:LDX#1:LDY#16:JMPpri
nt%
 2000.numb%PHA:LDA#31:JSR&FFEE:TX
A:JSR&FFEE:TYA:JSR&FFEE:PLA:ASLA:
TAY:.nu1:JSRnu2:INY:INY:CPY#10:BN
Enu1:RTS
 2010.nu2:LDX#47
 2020.nu3:INX:SEC:LDAnu:SBCdec,Y:
STAnu:LDAnu+1:SBCdec+1,Y:STAnu+1:
BPLnu3
 2030CLC:LDAnu:ADCdec,Y:STAnu:LDA
nu+1:ADCdec+1,Y:STAnu+1
 2040TXA:JMP&FFEE
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```
 2050.dec:EQUW10000:EQUW1000:EQUW
100:EQUW10:EQUW1
 2060.count%INCtco:LDAtco:CMPtdec
:BEQbon1:RTS:.bon1:LDA#0:STAtco
 2070.bonus:SEC:LDAtime%:SBC#8:ST
Atime%:LDAtime%+1:SBC#0:STAtime%+
1
 2080LDA#0:LDY#7:.bon2:STA(time%)
,Y:DEY:BPLbon2
 2090DECtime%+2:LDAtime%+2:CMP#6:
BCSbon4:LDX#peep MOD256:LDY#peep
DIV256:JSRsou
 2100.bon3:LDAtime%+2:BNEbon4:LDA
#1:STAdead:.bon4:RTS
 2110.doub%LDA#0:STA&70:LDA#31:JS
R&FFEE:TXA:JSR&FFEE:TYA:JSR&FFEE:
.d1:LDX&70:LDA&110,X:CMP#13:BEQd3
:STA&71:INX:STX&70
 2120LDX#&71:LDY#0:LDA#10:JSR&FFF
1:LDX#1:LDY#0:.d2:LDA&71,X:STA&CF
0,Y:INY:STA&CF0,Y:INY:INX:CPX#9:B
NEd2
 2130LDA#254:JSR&FFEE:LDA#8:JSR&F
FEE:LDA#10:JSR&FFEE:LDA#255:JSR&F
FEE:LDA#11:JSR&FFEE:JMPd1:.d3:RTS
 2140.cle%LDA#255:STAdata:JSRclpr
:LDA#0:STAdata
 2150.clpr:LDY#0:.cl2:LDA#0:STAad
d:LDA#&62:STAadd+1:.cl3:LDAdata:S
TA(add),Y:CLC:LDAadd:ADC#8:STAadd
:LDAadd+1:ADC#0:STAadd+1
 2160CMP#&79:BNEcl3:LDAadd:CMP#&C
0:BNEcl3:INY:CPY#8:BNEcl2:RTS
 2170.scr%LDA#17:STAdata:LDY#0:.s
c1:LDA#&58:STAadd+1:LDA#0:STAadd:
.sc2:LDAdata:STA(add),Y:CLC:LDAad
d:ADC#4:STAadd:LDAadd+1:ADC#0:STA
add+1:CMP#&80:BNEsc2:ASLdata:INY:
CPY#4:BNEsc1:RTS
 2180.peep:EQUW3:EQUW-15:EQUW140:
EQUW1
 2190.s1:EQUW1:EQUW1:EQUW100:EQUW
5
 2200.s2:EQUW1:EQUW2:EQUW30:EQUW2
 2210.s3:EQUW1:EQUW3:EQUW40:EQUW3
 2220.s4:EQUW0:EQUW-15:EQUW4:EQUW
3
 22301:NEXT:ENDPROC
 2240REM Stork right
 2250DATA 0,0,0,0,0,0,0,128,16,48
,48,48,16,16,16,112,128,192,67,19
2,128,0,0,128
 2260DATA 208,240,96,48,16,0,0,0,
240,112,224,80,176,224,4,4,128,12
8,128,128,0,0,0,0
 2270DATA 0,0,0,0,0,0,0,0,4,4,8,8
,4,4,4,10,0,0,0,0,0,0,0,0
 2280DATA 0,0,0,0,0,0,0,144,16,48
,48,48,16,16,16,48,128,193,66,193
,128,0,0,128
 2290DATA 176,208,96,48,16,0,0,1,
176,208,224,240,240,224,12,4,128,
128,128,128,0,0,0,0
 2300DATA 2,4,4,2,1,2,0,0,4,4,4,2
,2,9,0,1,0,0,0,0,0,0,8,4
 2310REM Stork left
 2320DATA 16,48,44,48,16,0,0,16,1
28,192,192,192,128,128,128,224,0,
0,0,0,0,0,0,16
 2330DATA 16,16,16,16,0,0,0,0,240
,224,112,160,208,112,2,2,176,240,
96,192,128,0,0,0
 2340DATA 0,0,0,0,0,0,0,0,2,2,1,1
,2,2,2,5,0,0,0,0,0,0,0,0
 2350DATA 16,56,36,56,16,0,0,16,1
28,192,192,192,128,128,128,192,0,
0,0,0,0,0,0,144
 2360DATA 16,16,16,16,0,0,0,0,208
,176,112,240,240,112,3,2,208,176,
96,192,128,0,0,8
 2370DATA 0,0,0,0,0,0,1,2,2,2,2,4
,4,9,0,8,4,2,2,4,8,4,0,0
 2380REM Egg
 2390DATA 0,0,0,0,102,255,255,102
,68,153,37,128,43,68,23,142
 2400REM hog
 2410DATA 0,0,0,0,0,0,0,0,0,0,0,0
,0,1,2,5,0,0,0,0,10,5,10,5,0,0,0,
0,8,4,10,5
 2420DATA 0,0,17,34,63,63,0,0,10,
141,238,255,221,139,6,12,10,5,10,
255,255,255,0,0,10,5,206,239,174,
6,3,1
 2430REM Hawk
 2440DATA 0,136,238,255,119,0,0,1
,111,159,102,255,255,9,9,6,0,17,1
19,255,238,0,0,8
 2450REM Bug
 2460DATA 68,238,238,103,1,1,2,0,
34,119,119,110,8,8,4,0
```


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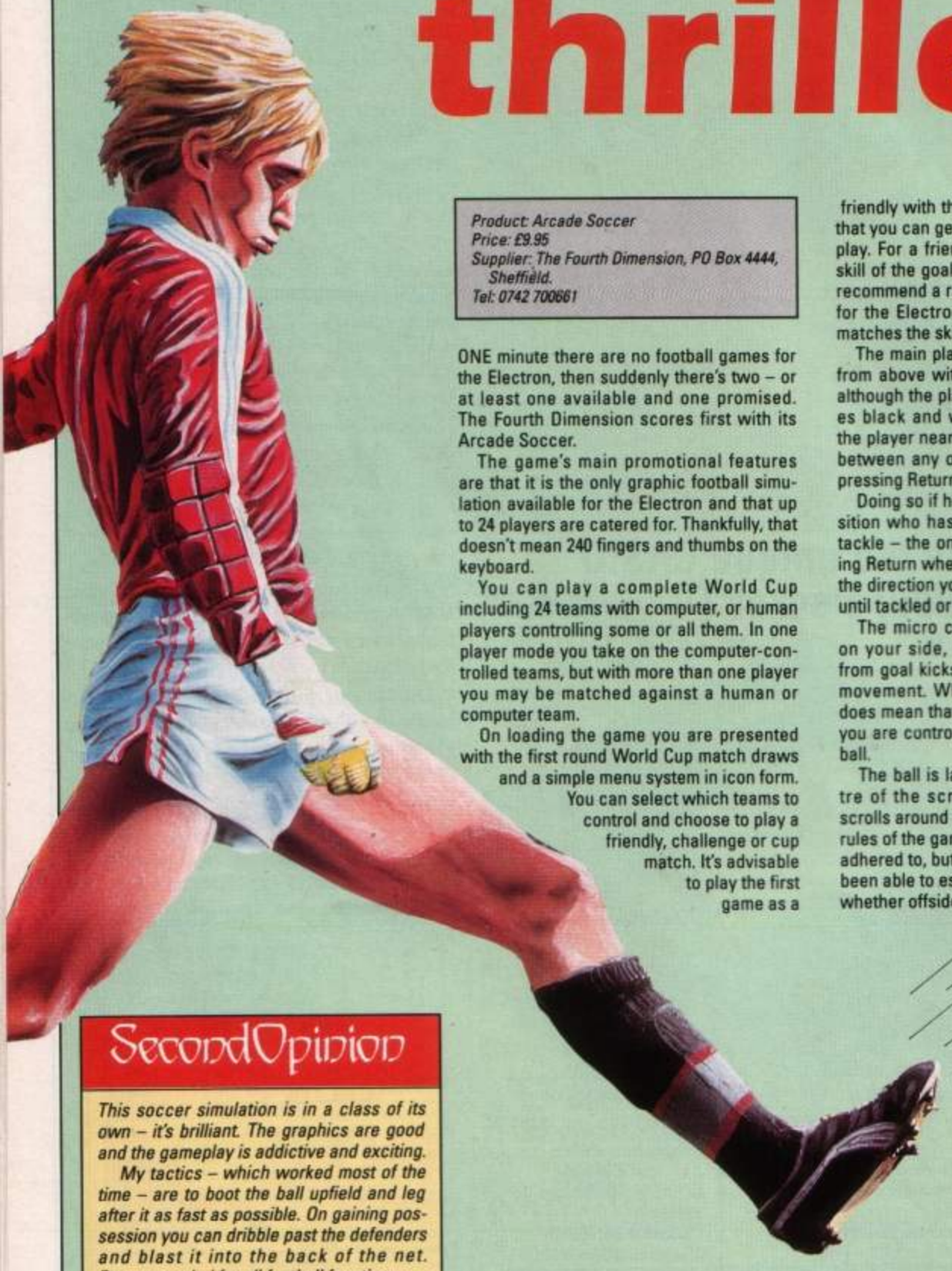
World Cup thriller



Product: Arcade Soccer
Price: £9.95
Supplier: The Fourth Dimension, PO Box 4444, Sheffield.
Tel: 0742 700661

ONE minute there are no football games for the Electron, then suddenly there's two – or at least one available and one promised. The Fourth Dimension scores first with its Arcade Soccer.

The game's main promotional features are that it is the only graphic football simulation available for the Electron and that up to 24 players are catered for. Thankfully, that doesn't mean 240 fingers and thumbs on the keyboard.

You can play a complete World Cup including 24 teams with computer, or human players controlling some or all them. In one player mode you take on the computer-controlled teams, but with more than one player you may be matched against a human or computer team.

On loading the game you are presented with the first round World Cup match draws and a simple menu system in icon form. You can select which teams to control and choose to play a friendly, challenge or cup match. It's advisable to play the first game as a friendly with the speed reduced to Slow so that you can get used to the keys and gameplay. For a friendly you can also adjust the skill of the goalies – to make sure you win I recommend a rating of nine for you and zero for the Electron. In the challenge and cup matches the skill is chosen at random.

The main play area, in Mode 5, is viewed from above with shirts either white or red, although the player who is on the ball flashes black and white. Normally you control the player nearest the ball, but you can flick between any of your players on screen by pressing Return.

Doing so if he is close to one of the opposition who has the ball results in a sliding tackle – the only type you get – and pressing Return when you have the ball kicks it in the direction you are facing. You can dribble until tackled or kicked.

The micro controls all the other players on your side, including the goalie. Apart from goal kicks you don't get to control his movement. While this works quite well it does mean that you can't change the player you are controlling while the goalie has the ball.

The ball is large and stays near the centre of the screen while everything else scrolls around it. All the obvious rules of the game are being adhered to, but I haven't been able to establish whether offsides are

SecondOpinion

This soccer simulation is in a class of its own – it's brilliant. The graphics are good and the gameplay is addictive and exciting.

My tactics – which worked most of the time – are to boot the ball upfield and leg after it as fast as possible. On gaining possession you can dribble past the defenders and blast it into the back of the net. Recommended for all football fanatics.

Roland Waddilove

included. It is possible to play through the World Cup very quickly using the one minute each way option (it seems more like 45 minutes when you're getting thrashed 9-0 by the computer).

You can opt for up to five minutes each way if you prefer a longer game. Everything runs just as it should with first and second round eliminations, semis and final.

If you are playing on your own I would advise not trying to run more than one team as you might end up playing against yourself! Only the full time scores are shown when two computer controlled teams play each other, so you don't have to sit through every match.

Under the challenge option you play each team in turn until you lose. I haven't managed to progress very far, so I can't say what awaits the winner.

The graphics are as good as they could be, with garbage overwriting the top and bottom of the screen above and below the playing window. The sound is limited to a whistle, a ball against boot kicking effect and frying chips cheering and applause. You can switch off the sound, but I didn't find it annoying enough to use that option.

The game is very playable and you get a feeling of real involvement as you knock the ball into the corner of the net straight past the diving goalie. It's definitely one to play again and again, and if you can gather together enough friends it could make for a good day's enjoyment – and not a lot of games can do that.

Janice Murray

Sound	5
Graphics	9
Playability	10
Value for money	9
Overall	9

Arcade Soccer is the first Electron football game to feature graphics

The World Cup fixture list and menu options

DIY magic

White Magic 2
Price: £9.95
Supplier: The Fourth Dimension, PO Box 4444, Sheffield.
Tel: 0742 700661

HARD on the heels of White Magic comes the sequel. The new game hardly differs from the original apart from a slightly modified title screen and the addition of a screen designer.

You get 32 new levels to play and pretty tough they are too. After a full day's play I only got to the fourth one. Still they are not so difficult that they discourage you from playing on.

The sound and graphics are all exactly the same as the previous version which means they're top quality backgrounds and characters and the sprites still resemble and move like the ones in Ravenskull.

However, the screen designer is what White Magic 2 is really all about. It is loaded separately and is stored after the game but before the first level on the tape. You are presented with the majority of the screen blank, a scrollable window containing the available icons, two areas showing the piece of scenery under the pointer and the other containing the currently selected one.

To create a level you just paint over the blank area. The Z, X, : and / keys move the cursor, while A, S, P and L are used to choose an icon. Return places an icon on the screen and Delete erases it. The manual I used was only the draft version, but I did take heed of the warning that the border must contain solid characters. You needn't worry however, as the editor has fairly extensive error checks which include examining the border, ensuring there is a trapdoor and master key.

Of course, what it can't do is check that the level can be completed – the overall design is up to you. It's very simple to just sit down and start creating, but the size of the screen is huge and designing puzzles requires a little forethought.

My first screen was a lovely symmetrical affair with the start in the bottom left and the end in the top right. However, when I came to play test it I had my first introduction to the less friendly aspects of this software.

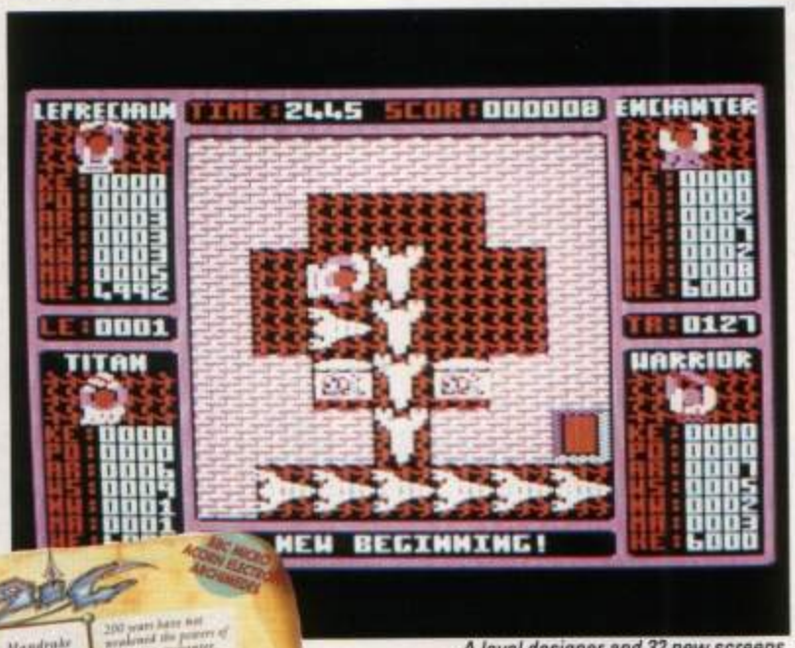
The start position must be within a small area in the top left of the screen. So much for my clever design – and no there isn't a rotate option. Then there's a whole series of questions about what to call the level, the time limit, where the teleports transport to and, finally, you're told what the edit code is – essential if you want to re-edit at a later date.

What's really annoying is that this happens every time you want to try out your creation. Why there couldn't have been another menu option to enter these details just once I really don't know – after all, the rest of the editor is well designed.

Anyway I went back to the drawing board and designed a whole new level which worked exceedingly well, if I do say so myself. There are a great number of factors which control how to design a screen but you learn these through experience. A devious mind also helps.

Lazarus

Sound	*6*
Graphics	*10*
Playability	*10*
Value for money	*9*
Overall	*9*



A level designer and 32 new screens provide the entertainment

SecondOpinion

Unless Superior can produce a new block buster pretty quick the Repton fan club will soon be turning its attentions to The Fourth Dimension's White Magic I and II. The sequel to the original arcade adventure includes 32 new levels plus a screen designer.

The editor is well equipped and easy to use, so when you've mastered the 32 levels supplied you can try your hand at designing your own and swap them with friends. Recommended.

Roland Waddilove

Neil Fawcett examines the new LSP-100 Epson compatible printer

A pretty solid Citizen

THE LSP-100 bi-directional dot matrix printer is Citizen's latest addition to an already impressive range of products. As with most printers, you have the option of friction or tractor feed and this can be selected easily by moving a lever on the top right of the casing.

You also have the option to load paper from underneath the printer using a process called bottom-feeding (as seen in Figure I). Loading paper this way can only be done when your printer is mounted on a stand.

The tractor feed mechanism must be attached to the printer and you must use continuous stationery. Loading paper is just like setting the tractor feed up, except the paper comes from underneath.

On the front right side of the printer are three buttons controlling the online status, form feed and line feed.

The printer must be brought offline before the feed buttons will work – rather annoying, but this is the case with several printers. Next comes a panel with three small lights – power, paper out and ready.

The DIP switches are easy to access: You simply switch the printer off and remove a cartridge-style interface located on the right of the printer as you look at it. You can then alter the switches to suit your micro. Instructions on how to do so are very well documented in the manual.

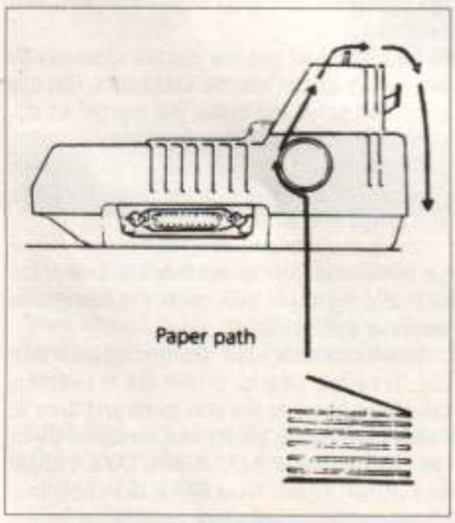


Figure I: Loading the printer using bottom-feeding

The printer is Epson-compatible and it is also switchable to IBM-compatible.

The LSP-100 is an 80 column printer and the print head has nine pins which are used to give you a 9 x 9 matrix.

When used in NLQ mode a double pass of the head allows the matrix to change to 17 x 17 and this gives you a wide variety of styles and typefaces.

The print speed is 150/175 characters per second (cps) at 10/12 characters per inch (cpi) in draft mode and 40 cps in NLQ mode. Now that is quite a mouthful, but it gives you an idea of the capabilities of this machine.

It is interesting to note that although this is quite a fast printer it is also very quiet. Even when doing a screen dump I could still manage to concentrate on other work while it was churning away.

There is a built-in 4k buffer – very useful indeed, as it allows you to continue working on your micro as the printer does its work.

However, there is a snag with the large buffer – there isn't a flush button. So, if you make a mistake you have to wait until that large 4k buffer empties. Alternatively you can turn the printer off.

Fitting the cartridge type ribbon poses no problems. It's claimed to last for two million characters – but I didn't have time to test this.

The LSP-100 has a sleek modern look and is surprisingly compact when you consider that it does some tasks that printers twice its price can't.

The manual is well presented and easy to read with plenty of diagrams showing things like fitting the ribbon and so on.

This is a superb printer, well priced and should satisfy the needs of most homes and small businesses.

Specifications

- 150/175 cps at 10/12 cpi in draft and 40 cps in NLQ
- Epson and IBM compatibility
- Parallel interface standard
- Tractor feed and friction feed
- 4k buffer
- 8 bit graphics capabilities
- Downloadable characters
- More than 400 print styles
- Automatic sheetfeeder available
- Bottom-feed paper loading option

Product: Citizen LSP-100 printer
Price: £286.35
Supplier: Citizen Europe, Wellington House, 4-10 Cowley Road, Uxbridge, Middlesex UB8 2XW.
Tel: 0895 72621

Adventures

By Pendragon

THE chill in the wind tells me that winter is creeping in and soon the bonfires will once more be lit to guide my knights back to Camelot. It will not be long before we will sit around the flames and recount tales of our adventures both new and old. What more can a king ask for than a trusty steed, a band of dour and loyal knights and an expanded Electron, on which to battle during the winter.

No new releases to report this month, but with a back catalogue of more than 500 Electron and Electron-compatible BBC Micro text adventures, you are hardly ever likely to be bored or stuck for a quest to endure.

While on the subject of back catalogues, I have copies of Special Operations (1984) and the original Magus version of Village of Lost Souls (1985) to give away to senders of the first full solutions I receive to Acornsoft's Quondam and Gateway to Karos.

Next time you are in a bookshop try to find a tome published by Penguin called *The Soul of a New Machine* by Tracy Kidder. The tale is about the design of a new computer way back in 1979, and describes the author's introduction to Crowther and Woods' Adventure.

If you want to know what adventuring is all about I suggest you turn to page 82 of this book and start reading! Old hands will recognise the scene straight away, and you can cut the atmosphere with a knife – it really is superb stuff.

This month's featured map is of the opening scenario to Epic's age old classic, Castle Frankenstein. I hope this will help adventurers who may still be stuck at the outset of this beautiful gothic romp.

Next month I continue this popular series with a guide to the openings to Riverdale's American Suds.

● *So until the frost forgets to bite, happy adventuring.*

Winter bon

Readers' Hall of Fame

Plane Crash — *James Farmer*

You begin trapped in your seat harness in the cabin of the crashed plane. To free yourself, you must LOOK and get the bag. Open it, get and open the shaving kit. Get the razor and cut the harness.

You must now deal with the fire. LOOK and take the extinguisher. Examine it, read the instructions and pull the pin. point the extinguisher at the fire and pull the lever to extinguish it. Open the door to avoid choking on the smoke.

Now go to the galley and examine the shelves. Ignore the beads, but take the survival pack and open it. Open the cupboard, take the box and open it. Take what you find and push the door with the extinguisher. Go out of the door, examine the pilot, examine his pocket and take the compass.

To get out, you must smash the windscreen with the extinguisher, clear the glass with the extinguisher and GO WINDSCREEN.

Go NORTH and put the spider in the box. Now LOOK and get the wood. Go EAST twice and open the box. Go WEST and LOOK. Keep looking until the light begins to fail. Then OPEN WOOL, DROP WOOL and drop the wood. Light a fire, then go EAST and sleep.

When you wake, go WEST, WEST, SOUTH, SOUTH, EAST, EAST, EAST and cross the river. You will now be in part two of the game. This part is set mainly in a jungle maze. You will be trapped in a hut and must act quickly to free yourself as the headhunters plan to sacrifice you to their god.

You must LOOK and get the grass, then light a fire and GO WALL. Now travel WEST, NORTH, NORTH, NORTH, LOOK, WEST, LOOK, EAST, EAST, EAST and examine the bush. Get the berries and go WEST twice. Now go SOUTH, SOUTH, SOUTH, EAST, EAST, EAST, NORTH, NORTH, WEST and EAT K RATIONS.

LOOK and TIE HOOK TO LINE. Bait the hook and CATCH FISH. Take the fish before going EAST, SOUTH, SOUTH, WEST, WEST, WEST, NORTH, NORTH, NORTH, NORTH, WEST, WEST, WEST, SOUTH, WEST, SOUTH to the clearing. Now LOOK and take the wood.

Go SOUTH and drop the grass and wood. Go SOUTH again and examine the ferns. Then go NORTH, light a fire, then cook and eat the fish. Now go SOUTH and sleep.

When you wake go NORTH and EAST twice. milk the goat and drink the milk. Go WEST, WEST, SOUTH, EAST, SOUTH, SOUTH, EAST and JUMP. To save yourself you must pull the handle and grab the dinghy. Now CLIMB DINGHY, GET OARS and ROW DINGHY. To finish the game, CLIMB STAGE.

Acheton — *Bob Purder*

Due to the massive size of this adventure, this solution will be serialised in many parts during the next few months.

Go into the house and collect the lamp, keys, bottle and paint. Now go and unlock the gate. Venture into the caves, turn your lamp on and get the casket. Visit the cloakroom, open the casket, take the coat and drop the casket. Now visit the Zoogeroom and get the sapphire, sail and thread. Go to the Slabroom and drop all but the lamp and sapphire.

Go EAST and get the marble. Journey to the giant's prison via the star room. Get the plate and beryl and throw the marble as the giant approaches. Take the opportunity to get the crown, go to the star room and turn off your lamp. Now drop the beryl, sapphire and zooge and turn the lamp on.

Go to the orb and drop the crown. Now go to the slab, drop the marble and plate and take the keys. Now enter the stockroom and take the manacles.

You must now visit the tomb room and dig. Take the pearls, throw the manacles, take the dagger to the star room and drop it. Collect the ebony, pillow and matches. Go to the fissure, DROP ALL, JUMP, TAKE VIOLIN and JUMP again. Now TAKE ALL including the mace. *(Continued next month)*

Overture and Beginners

Since I started this section of the adventure column almost three years ago, many readers have written in asking when particular aspects of text adventuring have been covered.

So to placate all you diehards and novices, here is a run down of the itinerary to the beginners' help section since it began in December 1986.

Setting out: **December 1986/January 1987**
Mapping techniques: **February 1987-April 1987**
Adventure logic: **May 1987/June 1987**
Mazes: **July 1987/August 1987**
Problem solving: **September 1987/October 1987**
Glossary of adventuring terms: **November 1987-May 1989**
Producing atmosphere: **June 1989**
Collecting and utilising objects: **July 1989**
Riddles and puzzles: **September 1989**
Adventure parsers: **October 1989**

fires

Problems Solved

This month I continue with help in what is in my opinion the most difficult adventure ever to be released for the Electron. What follows should guide you through the strange lands upon which **The Ferryman Awaits** is built.

Well: This is a short cut to the tunnel west of the mud lake. After the rock fall the well is filled with rubble.

Mud lake: You can go South East to the bay and the tunnel after the fungus has grown. The level rises after the roof has been brought down. Then you can cross North to the dark opening and collect the cube.

Stairway: To reach the top leading to Agrogorggan's lair you must create a mist so the archers can't see to shoot.

Gap: DROP DOOR at the west end of the ledge in the tunnel running West from the lake. LOOK reveals the bar.

Gravel slope: At the bottom DIG, which moves you several locations down river and uncovers a lump of sulphur – revealed only after returning there. At the top, drop or THROW BAR to fix the rope which allows the slope to be climbed.

Temple: Reached by going West then North West from the Guardroom. EXAMINE STATUE reveals that it is movable.

Roof of tower: Enter the gap by the statue, THROW BAR and climb the rope which hangs from the hand.

Balcony: Reached by going along the ledge

Turn to Page 20 ►

◀ *From Page 19*

North East from the gap.

Desert: Go South East across the lake as far as possible, then East. Use the hat to get to the gully. Travel North, South, East, West, East, East to reach the river South of the tower.

Sandstone gully: The horn is here. You will also find any object dropped in the desert.

Stone bridge: Go from the desert to the south end of Tower Bridge. NORTH WEST triggers a semi-automatic sequence to the North-South gully. Move to the gully below the stone bridge, then go up.

Mist-filled hollow: EAST from the stone bridge. Examine the mist for a vision of the tower. WEAR HAT transports you to South of the bridge. Objects dropped here disappear.

Stone tree: WEST, SOUTH WEST, EAST from the stone bridge. An old man in the branches exchanges the rod (magic wand) for chalk with which you draw the pentagram.

Rock chamber: Drop the horn here. A glowing pentagram is then seen: SAY DEATH, TIME, AGROGORGGAN and NAGGROGORGA to conjure them up briefly. After the waiting room time lapse this has a different effect.

Valley of the shadow of death: DRINK and examine the mirror which shows you are now one of the living dead and immune to the guards' spears, Agrogorggan's burning eye, rock falls and so on.

Windswept plain: Use the hat to reach the circle of stones and the jerkin – objects dropped on the plain turn up here.

Pirate cave: Go North West from the beach. You must be wearing the tricorn hat, jerkin, boots and carrying the parrot and keg of rum. Take an inventory and it will show that the keg has been exchanged for a sticky lump of tar.

Rock fall in tunneL: Return to the Tower, go South East across the lake and through the tunnel to the section with the cracked roof. SAY MORVELL and the sword explodes, bringing down the roof. Escape from the crack in ground with the horn by SAY MOLD.

Mud lake: Back to the tower. You can't descend the stairway as the level of the lake has risen, but you can now go North across the pumice blocks to the dark opening.

Dark opening: Leads to the chamber where you find the cube.You must wear the boots, or the roof caves in.

Waiting room: In the temple. Waiting is fatal unless you are one of the living dead. LICK CUBE and it brings horrifying visions, and eons of time pass by. EXAMINE MIRROR shows a skull-like face. LOOK and the slab has cracked.

Hall of black marble: WEST from the top of staircase. Horned demons guard the entrance NORTH to Agrogorggan's lair. They can be killed with the magic sword but then the roof can't be brought down in the tunnel. Wear the robe and carry the scythe and they draw back in fear.

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Shopping Spree

SHOPPING Spree is a text adventure game in which you take the part of a 12-year-old boy who is shopping for Christmas presents for his family. They are a fussy lot and very difficult to please, which makes your task all the more frustrating.

You start out in the High Street and can enter any of the shops you see there. Many potential presents will catch your eye, but you must choose wisely as you have only £15 to spend on your mother, father, sister and pet dog. Watch out for thieves who may steal your bag, and don't give away your money to strange beggars. Or perhaps you should, for they may do you a good turn when you desperately need help.

Take care to buy the correct present for each member of your family as they will be very ungrateful and angry if you don't. What a miserable lot, and in the festive season too!

A quick run down on your family will help you choose the right presents: Your mother is middleaged, a typical nagger. Quite knowledgeable about pop music, but still thinks we're living in the 60s. Your father is young and trendy, and is sure he is the greatest. He's quite generous. Sister is posh but bossy – likes to have her own way. She loves listening to Beethoven. The dog is affectionate but greedy, especially around meal times.

After buying all the presents you wait for Christmas Day, and when it finally comes round you hand them out. Did you buy the right ones, or are you sent to your bedroom for the rest of the day? Play Shopping Spree and find out...

Christmas shopping crowds getting you down? Then try this simulation from Peter and Deborah Wood

```
   10 REM Shopping Spree
   20 REM By Peter & Deborah Wood
   30 REM (c) Electron User
   40 VDU 23,255,0,24,36,66,126,1
26,126,126
   50 MODE 6
   60 VDU 19,1,2,0,0,0:
   70 CLS
   80 PRINT TAB(11,1)"SHOPPING SP
REE"
   90 PRINT TAB(0,2);"By Peter &
---------- Deborah Wood"
  100 PRINT TAB(0,3);
  110 FOR A=0 TO 39
  120 VDU 255;:NEXT
  130 PROCINST
  140 END
  150 DEFPROCINST
  160 FOR x=0 TO 38:PRINT TAB(x,2
4);CHR$(255);
  170 NEXT
  180 VDU 28,0,23,39,4:
  190 PRINT TAB(12,0)"INSTRUCTION
S"
  200 PRINT
  210 PRINT "It is very near to C
hristmas and it is  now time to g
o on your yearly shopping  spree,
 buying gifts for your family."
  220 PRINT "You have £15 to spen
d in all the shops  visited. Soun
ds easy, but, your family  are ve
ry difficult to buy for and are
 certainly not afraid of speaking
 their  minds when it comes to Ch
ristmas        presents."
  240 PRINT
  250 PRINT "THE BRIEF SUMMARY GI
VEN OF EACH PERSON  WILL HELP YOU
 DECIDE WHAT TO BUY."
  260 PRINT"YOU ARE ALSO TIMED, S
TARTING WHEN YOU   PRESS SPACE"
  270 PRINT TAB(10,18);"HAPPY SHO
PPING!!..."
  280 PRINT TAB(12,19)"PRESS <SPA
CE>";
  290 REPEAT
  300 KEY$=INKEY$(1)
  310 UNTIL INKEY(-99)
  320 PROC1
  330 ENDPROC
  340 DEFPROC1
```

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◄ From Page 21

```
  350 CLS
  360 M=0
  370 TIME=0
  380 MONEY%=1500
  390 CASE%=0
  400 EAR%=0
  410 MUG%=0
  420 M=0
  430 B=0
  440 S=0
  450 X=0
  460 R=0
  470 BONE%=0
  480 PRINT:PRINT"                **
**********":PRINT
  490 PRINT "You are standing in
the square, and you can see two s
hops,NEXT and WHSMITHS.    NEXT h
as a large sale sign in the windo
wbut you spot a particularly love
ly      pencil case in the window
 of WHSMITHS,  in beautifully";
  500 PRINT "complimentary flures
ent pink and green."
  510 PRINT:INPUT "DO YOU GO INTO
 SMITHS OR NEXT?(S/N)"A1$
  520 IF A1$="S" PROC2
  530 IF A1$="N" PROC3 ELSE PRINT
: PRINT "INPUT-NOT ACCEPTABLE....
..":GOTO 510
  540 ENDPROC
  550 DEFPROC2
  560 PRINT:PRINT"                **
**********":PRINT
  570 PRINT
  580 PRINT "You enter SMITHS and
 inquire about the  cost of the p
encil case, and find it is partic
ularly expensive-£5.50-can you
 afford it? Remember you still ha
ve threepresents to buy."
  590 PRINT:INPUT "DO YOU BUY THE
 PENCIL CASE(Y/N)?"A2$
  600 PRICE%=550
  610 IF A2$="Y" PROCBUY
  620 IF A2$="Y" AND R=1 PROC4
  630 IF A2$="N" OR A2$="Y" AND R
=0 PROC5 ELSE PRINT'"INPUT-NOT AC
CEPTABLE......":GOTO 590
  640 ENDPROC
  650 DEFPROC3
  660 PRINT:PRINT"                **
**********":PRINT
  670 PRINT "You've seen it, the'
bargain of the      century, but
it's over at the other sideof the
 shop! You see several people
 moving towards the earings (£4.5
0) whichyou know will suit your s
ister."
  680 PRINT:INPUT "DO YOU MAKE AN
 EXHIBITION OF YOURSELF BYRUNNING
 ACROSS THE SHOP(Y/N)?"A3$
  690 IF A3$="Y" PROC8
  700 IF A3$="N" PROC10
  710 ENDPROC
  720 DEFPROC4
  730PRINT:PRINT"               ***
*********":PRINT
  740 CASE%=1
  750 PRINT"'You are our millionth
 customer in our  new store' say
s the cashier.You can havea £2.50
 gift voucher. You feel a little
hungry."
  760 PRINT:INPUT "DO YOU BUY A B
OX OF SWEETS TO EAT-THOSE CREAM F
ILLED ONES YOU REALLY ADORE(Y/N)?
"A4$
  770 IF A4$="Y" PROC6
  780 IF A4$="N" PROC7 ELSE PRINT
: PRINT "INPUT-NOT ACCEPTABLE....
..":GOTO 760
  790 ENDPROC
  800 DEFPROC5
  810PRINT:PRINT"               ***
*********":PRINT
  820 PRINT "Where next?-Eexactly
 NEXT. You have     LOADSA MONEY
left, but lots of presents to buy
. But, as you come out of the
 store, a rather distressed looki
ng      female is asking if anyon
e can lend";
  830 PRINT " her £1 to make a ph
one-call as she has      forgotte
n her purse and must be back to w
ork in five minutes."
  840 PRINT:INPUT "THIS SEEMS A L
OT OF MONEY FOR A PHONE   CALL, B
UT DO YOU GIVE IT TO HER(Y/N)?"A5
$
  850 IF A5$="Y" M=1 ELSE M=0
  860 PRINT
  870 PRINT"YOU NOW GO TO NEXT":P
ROC3
  880 ENDPROC
  890 DEFPROC6
  900PRINT:PRINT"               ***
*********":PRINT
  910 PRINT "You buy and eat the
sweets, and feel    much better."
:PROC5
  920 ENDPROC
  930 DEFPROC7
  940PRINT:PRINT"               ***
*********":PRINT
  950 PRINT "You feel very hungry
, and begin to feel dizzy. The ne
xt thing you remember is a large
crowd peering down at you, and
 your head hurts. Your cheeks are
 a      rather reddish colour and
 you decide"
  960 PRINT "your best option is
to return home as quickly as poss
ible.":PROCEND
  970 ENDPROC
  980 DEFPROC8
  990PRINT:PRINT"               ***
*********":PRINT
 1000 PRICE%=450
 1010 PRINT "A hand comes down on
 your shoulder, it  is the store
detective.'Who do you thinkyou ar
e, running like that."
 1020 IF M=1 PRINT "But it's the
lady you helped earlier    and sa
ys it is Ok, and goes and gets th
eear-rings for you to buy and ret
urns thepound she borrowed earlie
r."
 1030 IF M=1 EAR%=1 ELSE EAR%=0
 1040 PROCBUY
 1050 IF M=0 PRINT "You are in de
ep trouble, 'Out of this   shop i
mmediately,' she says."
 1060 PRINT:PRINT"ANOTHER SHOP NO
W.....":PROC10
 1070 ENDPROC
 1080 DEFPROC9
 1090PRINT:PRINT"               ***
*********":PRINT
 1100 PRINT "You just make it to
see someone else    lift the ear-
rings off the shelf-hard   luck,
Pal."
 1110PRINT:PRINT"ANOTHER SHOP NOW
.....":PROC10
 1120 ENDPROC
 1130 DEFPROC10
 1140PRINT:PRINT"               ***
*********":PRINT
 1150 PRINT "You go out into the
precinct, and       consider BOOT
S as your next choice-you  enter
the shop."
 1160 PRINT:INPUT "WHICH DEPARTME
NT DO YOU GO TO-RECORDS,  HOUSEHO
LD OR PET ITEMS(R/H/P)?"A10$
 1170 IF A10$="R" PROC11
 1180IF A10$="H" PROC12
 1190IF A10$="P" PROC13 ELSE PRIN
T :PRINT "INPUT- NOT ACCEPTABLE..
.....":GOTO 1160
 1200 ENDPROC
 1210 DEF PROC11
 1220PRINT:PRINT"               ***
*********":PRINT
 1230 PRINT "As you make your way
 to the record      counter, you
notice a sign which says   'Buy a
ny 2 singles get one free.' Just
 at this moment a small boy rushe
```

Turn to Page 24 ►

SHOPPING SPREE

By Peter & ---------- Deborah Wood

You enter SMITHS and inquire about the cost of the pencil case, and find it is particularly expensive-£5.50-can you afford it? Remember you still have three presents to buy.

DO YOU BUY THE PENCIL CASE(Y/N)?Y

****

'You are our millionth customer in our new store' says the cashier.You can have a £2.50 gift voucher. You feel a little hungry.

DO YOU BUY A BOX OF SWEETS TO EAT-THOSE CREAM FILLED ONES YOU REALLY ADORE(Y/N)?

electron user MAIL ORDER OFFERS

Here's how you can get the very best out of your Electron

Within the pages of these three books you'll find ALL the information you need to fully harness the power of your Electron. They cover Basic, machine-code programming and the operating system, and between them they also show how to combine all three to create more powerful and effective programs.

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Electron Advanced User Guide

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- Program the ULA
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- Use the Electron's exciting capabilities to the full by following the complete circuit diagram

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This is the ultimate guide available on BBC Basic. Written by a leading expert on the language, it will lead you through each Basic function in a simple, easy-to-follow style.

Whether you are a beginner or more advanced, there are examples of commonly-needed routines and neat tricks you can use to make Basic jump through hoops.

By working through its many examples you will gain a clear insight into structured programming and will quickly acquire the ability to use structured techniques in creating your own programs. *Save £3 off the recommended retail price.*

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TO ORDER PLEASE USE THE FORM ON PAGE 45

◀ From Page 22

```
s past"
 1240 PRINT"and snatches your car
rier bag, which    contains your
money."
 1250 PRINT:INPUT "DO YOU RUN AFT
ER HIM(Y/N)?"A11$
 1260 IF A11$="Y" PROC14
 1270 IF A11$="N" PROC15 ELSE PRI
NT :PRINT "INPUT- NOT ACCEPTABLE.
......":GOTO 1250
 1280 ENDPROC
 1290 DEF PROC12
 1300PRINT:PRINT"                ***
*********":PRINT
 1310 PRINT "In the household sec
tion, you find a setof mugs which
 are £4.50. They are       beauti
fully designed, but can you affor
dthem?"
 1320 PRINT:INPUT "DO YOU BUY THE
 MUGS(Y/N)?"A12$
 1330 PRICE%=450:
 1340 IF A12$="Y" PROCBUY
 1350 IF A12$="Y" AND R=1 PROC16
 1360 IF A12$="N" OR A12$="Y" AND
 R=0 PROC17 ELSE PRINT :PRINT "IN
PUT- NOT ACCEPTABLE.......":GOTO
1320
 1370 ENDPROC
 1380 DEF PROCBUY
 1390 R=1
 1400 CHANGE%=MONEY%-PRICE%
 1410 IF CHANGE% < 0 PROCNO ELSE
MONEY%=CHANGE%
 1420 ENDPROC
 1430 DEF PROCNO
 1440 R=0
 1450 PRINT "YOU DO NOT HAVE SUFF
ICIENT MONEY...      SORRY ABOUT T
HAT."
 1460 ENDPROC
 1470 DEF PROC13
 1480PRINT:PRINT"                ***
*********":PRINT
 1490 PRINT "At the pet section y
ou see a rather nicebone for 50p,
 but are apprehensive over whethe
r it it enough for your beloved
 dog."
 1500 PRINT:INPUT "DO YOU BUY THE
 BONE(Y/N)?"A13$
 1510 PRICE%=50
 1520 IF A13$="Y" PROCBUY
 1530 IF A13$="Y" AND R=1 PROC18
 1540 IF A13$="N" OR A13$="Y" AND
 R=0 PROC19 ELSE PRINT :PRINT "IN
PUT- NOT ACCEPTABLE.......":GOTO
1500
 1550 ENDPROC
 1560 DEFPROC14
 1570PRINT:PRINT"                ***
*********":PRINT
 1580 PRINT"You run after him sho
uting THIEF, and   just manage to
 catch his jacket as he isabout t
o leave the shop, and retrieve
 your money."
 1590 PRINT"An elderly lady canno
t thank you enough,as the boy had
 also stolen her handbag! She giv
es you £2 to say thankyou."
 1600 MONEY%=MONEY%+200
 1610 PRINT:INPUT"WHERE NOW, THE
HOUSEHOLD OR PET SECTION (H/P)?"A
14$
 1620 IF A14$="H" PROC12
 1630 IF A14$="P" PROC13 ELSE PRI
NT :PRINT "INPUT- NOT ACCEPTABLE.
......":GOTO 1610
 1640 ENDPROC
 1650 DEFPROC15
 1660PRINT:PRINT"                ***
*********":PRINT
 1670 PRINT "There is nothing for
 it but to return   home with wha
t you have. On your way outof the
 shop, you notice a comotion, and
 see the small boy has been caugh
t, and  your money is returned."
 1680 PRINT:INPUT"WHERE NOW, THE
HOUSEHOLD OR PET SECTION (H/P)?"A
14$
 1690 IF A14$="H" PROC12
 1700 IF A14$="P" PROC13 ELSE PRI
NT :PRINT "INPUT- NOT ACCEPTABLE.
......":GOTO 1680
 1710 ENDPROC
 1720 DEF PROC16
 1730PRINT:PRINT"                ***
*********":PRINT
 1740 MUG%=1
```

```
 1750 PRINT "You buy the mugs and
 continue onto the  pet section."
 1760 PROC13
 1770 ENDPROC
 1780 DEF PROC17
 1790PRINT:PRINT"                ***
*********":PRINT
 1800 MUG%=0
 1810 PRINT "You do not buy the m
ugs but continue on to the pet se
ction."
 1820 PROC13:ENDPROC
 1830 DEFPROC18
 1840 BONE%=1
 1850PRINT:PRINT"                ***
*********":PRINT
 1860 PRINT "You buy the bone, an
d it is gift wrappedWHAT NEXT? It
 is 5:00pm so it is quite  late."
 1870 PRINT:INPUT"DO YOU RETURN H
OME, OR GOTO ANOTHER SHOP(H/S)?"A
18$
 1880 IF A18$="H" PROCEND
 1890 IF A18$="S" PROC20 ELSE PRI
NT: PRINT "INPUT-NOT ACCEPTABLE..
....":GOTO 1870
 1900 ENDPROC
 1910 DEF PROC19
 1920 BONE%=0
 1930PRINT:PRINT"                ***
*********":PRINT
 1940 PRINT "You do not buy the b
one. There is a nicepet store nex
t door, so you go on to    there.
 Here is a lovely box of dog
 biscuits-£2.50"
 1950 PRINT:INPUT "DO YOU BUY THE
 BISCUITS(Y/N)?"A19$
 1960 PRICE%=250
 1970 IF A19$="Y" PROCBUY
 1980 IF A19$="Y" AND R=1 THENPRO
C21
 1990 IF A19$="N" OR A19$="Y" AND
 R=0 PROC22 ELSE PRINT: PRINT "IN
PUT-NOT ACCEPTABLE......":GOTO 19
50
 2000 ENDPROC
 2010 DEFPROC20
 2020PRINT:PRINT"                ***
*********":PRINT
 2030 PRINT"You now make your way
 to the sweet shop.Here is a love
ly box of chocolates only £4.50"
 2040 PRICE%=450
 2050 PRINT:INPUT "DO YOU BUY THE
 CHOCOLATES(Y/N)?"A20$
 2060 IF A20$="Y" PROCBUY
 2070 IF A20$="Y" AND R=1 PROC23
 2080 IF A20$="N" OR A20$="Y" AND
 R=0 PROC24 ELSE PRINT: PRINT "IN
PUT-NOT ACCEPTABLE......":GOTO 20
50
 2090 ENDPROC
 2100DEF PROC21
 2110 PRINT:PRINT"                **
**********":PRINT
 2120 B=1
 2130 PRINT"You buy the biscuits
and make your way  to the sweet s
hop.":PROC20
 2140 ENDPROC
 2150 DEFPROC22
 2160 B=0
 2170PRINT:PRINT"                ***
*********":PRINT
 2180 PRINT"You don't buy the bis
cuits and make yourway to the swe
etshop."
 2190 PROC20:ENDPROC
 2200 DEFPROC23
 2210PRINT:PRINT"                ***
*********":PRINT
 2220 PRINT"As you lift the box o
f chocolates of theshelf, the who
le pile comes tumbling to the gro
und!"
 2230 PRINT:INPUT"DO YOU HANG ARO
UND(Y/N)?"A23$
 2240 IF A23$="Y" PROC25
 2250 IF A23$="N" PROC26 ELSE PRI
NT'"INPUT-NOT ACCEPTABLE......":G
OTO 2230
 2260 ENDPROC
 2270 DEF PROC24
 2280 PRINT "                    *******
*****":PRINT
 2290PRINT:PRINT"                ***
*********":PRINT
 2300 PRINT "You decide not to bu
y the sweets, and   make your way
 home, hoping you have     someth
ing nice for everyone."
 2310 PROCEND
 2320 ENDPROC
 2330 DEF PROC25
 2340PRINT:PRINT"                ***
*********":PRINT
 2350 S=1
 2360 PRINT "The shop assistant h
elps you to restack to shelves, a
nd you buy the chocolates. It is
```

```
late now and you must go home."
 2370 PROCEND
 2380 ENDPROC
 2390 DEFPROC26
 2400PRINT:PRINT"              ***
*********":PRINT
 2410 MONEY%=MONEY%+450
 2420 PRINT "Just as you attempt
to make a quick get away, the lad
y in the shop stops you.   You ha
ve to restack all the sweets
 single handedly."
 2430 PRINT "You eventually leave
 the shop, and make your way home
. Then you realise you haveleft y
our presents in the sweet shop,
 you return to find it closed.";
 2440 PRINT "You have no time to
buy anymore presentsand MUST retu
rn home."
 2450 S=0:MUG%=0:EAR%=0:PENCIL%=
0:B=0:BONE%= 0:S=0
 2460 PROCEND
 2470 ENDPROC
 2480 DEF PROCEND
 2490 PRINT:PRINT "           PRE
SS<SPACE>":REPEAT:LET KEY$=INKEY$
(1):UNTIL INKEY(-99)
 2500 CLS
 2510 FOR A=1 TO 19
 2530 PRINT "IT'S CHRISTMAS DAY,
IT'S CHRISTMAS DAY."
 2540 NEXT
 2550 FOR C=0 TO 200:VDU 19,1,RND
(7),0,0,0:NEXT
 2560 CLS:VDU 19,1,2,0,0,0
 2570 PRINT :PRINT "Please use th
ese key-words...."
 2580 PRINT "EARRINGS; PCASE; DBI
SCUITS; CHOCOLATES; BONE;   MUGS.
"
 2590 PRINT'"It is now time to gi
ve out the presents.The presents
you have are..."
 2600PRINT
 2610IF CASE%=1 PRINT " PCASE";
 2620IF EAR%=1 PRINT " EARRINGS";
 2630IF MUG%=1 PRINT " MUGS";
 2640IF B=1 PRINT " DBISCUITS";
 2650IF S=1 PRINT " CHOCOLATES";
 2660IF BONE%=1 PRINT " BONE";
 2670IF S=0 AND CASE%=0 AND EAR%=
0 AND MUG%=0 AND B=0 AND BONE%=0
PRINT "NOTHING...";
 2680 PRINT
 2690 PRINT "IF YOU HAVE NOTHING
FOR THAT PERSON     PRESS <RETURN
>"
 2700 PRINT:PRINT "IF YOU ATTEMPT
 TO GIVE THEM SOMETHING   YOU DO
NOT HAVE YOUR FAMILY WILL NOT BE
PLEASED..."
 2710 PRINT
 2720 INPUT "WHAT HAVE YOU BROUGH
T FOR YOUR SISTER..."G$
 2730 IF G$="EARRINGS" AND EAR%=1
 PRINT "YOUR SISTER IS VERY PLEAS
ED...AND ALLOWSYOU TO USE HER BEE
THOVEN RECORDS"
 2740 IF G$="EARRINGS" AND EAR%=1
 X=X+25 ELSE PRINT "YOUR SISTER I
S DISGUSTED"
 2750 INPUT'"WHAT HAVE YOU BROUGH
T FOR YOUR FATHER..."F$
 2760 IF F$="PCASE" AND CASE%=1 P
RINT "YOU ARE GIVEN A RISE IN POC
KET MONEY."
 2770 IF F$="PCASE" AND CASE%=1 X
=X + 25 ELSE PRINT "YOUR FATHER G
ROUNDS YOU FOR ONE MONTH."
 2780 INPUT'"WHAT HAVE YOU BROUGH
T FOR YOUR MOTHER..."M$
 2790 IF M$="CHOCOLATES" AND S=1
PRINT "THANKYOU, LOVE. WHAT A NIC
E THOUGHT."
 2800 IF M$="CHOCOLATES" AND S=1T
HEN X=X + 25 ELSE PRINT "YOU CAN
DO YOUR OWN COOKING AND IRONING I
N FUTURE."
 2810 INPUT'"WHAT HAVE YOU BROUGH
T FOR YOUR DOG..."D$
 2820 IF D$="DBISCUITS" AND B=1 P
RINT "HE LICKS YOU ALL OVER YOUR
FACE."
 2830 IF D$="DBISCUITS" AND B=1 X
=X + 25 ELSE PRINT "YOUR DOG BITE
S YOU."
 2840 PRINT'"YOUR SCORE IS ";X;"%
";
 2850 PRINT'"YOUR TIME IS ";TIME
DIV 100;" secs"
 2860 PROCGO
 2870 ENDPROC
 2880 DEFPROCGO
 2890 PRINT'"WOULD YOU LIKE ANOTH
ER GO(Y/N)?"
 2900 REPEAT
 2910 KEY$=INKEY$(1)
 2920 UNTIL INKEY(-69) OR INKEY(-
86)
 2930 IF INKEY(-69) CLS:GOTO 180
ELSE GOTO 2940
 2940 PRINT "BYE-BYE":END
 2950 ENDPROC
```


QUAL-SOFT **THOUGHTWARE** **Sports simulations**

"A real challenge to the thinking football fan . . . Bobby Robson could do worse than have a crack at this in his preparation for the World Cup". **AMSTRAD ACTION REVIEW**

QUAL-SOFT COMMENT: At last an INTELLIGENT management game for the knowledgeable soccer enthusiast!

TAPE 1 QUALIFIERS

ROME 90*

TAPE 2 FINALS

A WORLD CUP MANAGEMENT SIMULATION

Summer 1988 and English International football is at its lowest ebb. We have failed miserably for the European Nations Cup, and had a string of very poor International results. In a few months we will set out on the '90 World Cup qualifying trail. You have been given the most important job of restoring English pride in their football. You have a match in Athens, Denmark at Wembley, and a South American tour, to asssemble a team, first to qualify, and then to beat the world's best in Athens.

TAPE 1 (Qualifiers)

- ★ Current squad of 16 players + 20 user defined players.
- ★ Friendlies in Athens, at Wembley + South American tour.
- ★ ANY team formation you choose. 2 from 5 substitutes.
- ★ In match tactics: any no. of individual player adjustments.
- ★ Your qualification group: full results and table.

TAPE 2 (Finals)

- ★ Choose a 20 man squad to take to the finals.
- ★ Group of 4 prelims. 16 to final knockout comp.
- ★ Extra Time, PENALTY SHOOT-OUTS, where relevant.
- ★ Formation and strength information on opposition.
- ★ 2 from 9 substitutes (the FA tells us so).

ENGLAND'S GAMES: FULL PITCH, 22 MAN, 3D GRAPHICS & SOUND EFFECTS

QUAL-SOFT comments: With 5 levels of play, 12 depths of sophistication, and "fun" graphics, this game can be enjoyed by an 8 year old youngster as a "fun" game, and by the most sophisticated as a tactical/strategy challenge of the highest order.

PACKAGE: Tape 1 plus Tape 2 plus 20 Page Manual **£9.95** *(57K RAM usage. Some would call this a MEGAGAME.* YES IT WILL RUN ON YOUR 32k ELECTRON.

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*** ROME '90 is an update of the classic MEXICO '86**

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Fast and furious action is the order of the day with Stuart Bain's game

Dollar Dash

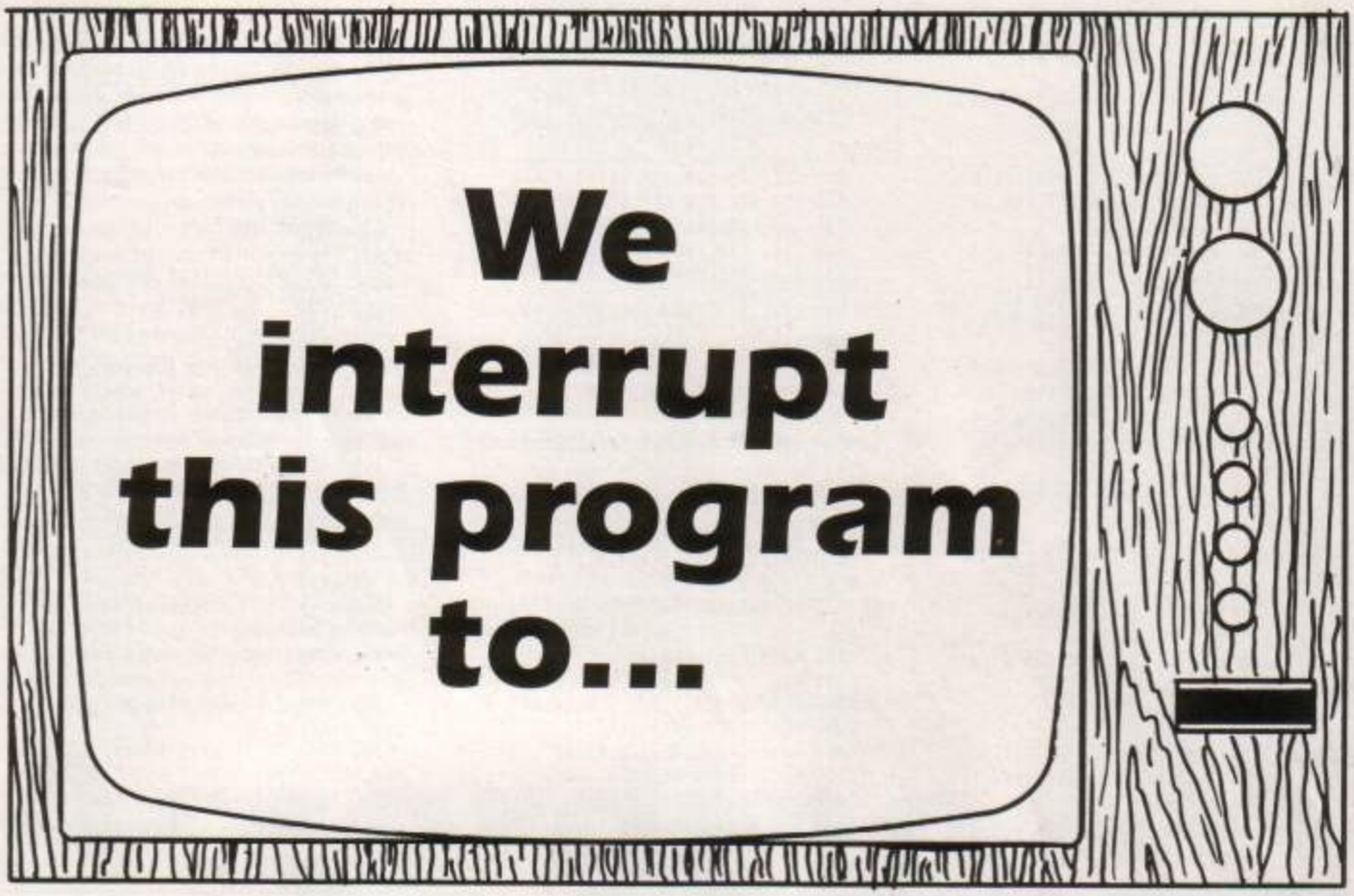
THIS simple but addictive game is based on that old favourite Tron, or Light Cycles. The action takes place on the stock market and your task is to prevent the dollar from cornering the market and crashing the pound.

The screen is mainly blank except for a wall around the border and a pound and dollar placed at random somewhere in the middle. The dollar sets off in a random direction, turning left or right as necessary to avoid obstacles. The pound also sets off and it is up to you to make sure it doesn't bump into anything.

Both currencies leave a trail of the appropriate money behind them and the object is to corner the dollar and make it crash into your trail, the wall or its own trail. The computer-controlled dollar will try to do the same to you. If you crash the dollar you'll move on to the next level where you'll pit your wits against two dollars. Complete this and you'll face three dollars, and so on, up to a total of six.

The action is fast paced and very addictive. The computer controlled dollars are quite clever, but it is possible to trap them if you keep your wits about you.

```
   10 REM Dollar Dash
   20 REM By Stuart Bain
   30 REM (c) Electron User
   40 DIM S%(1240),A%(5),B%(5),de
%(5)
   50 MODE 4
   60 R%=RND(7):VDU 19,1,R%;0;19,
0,R%EOR7;0;
   70 VDU 23,1,0;0;0;0;23,224,&FF
FF;&FFFF;&FFFF;&FFFF;
   80 lev%=0:de%=0
   90 PRINTTAB(10,12)"Stop the Do
llar from"TAB(10,14)"Cornering th
e Market"
  100 FORI=0TO2000:NEXT
  110 REPEAT CLS
  120 FOR I%=0 TO 1240:S%(I%)=0:N
EXT
  130 PRINT STRING$(40,CHR$224)TA
B(0,30)STRING$(40,CHR$224);
  140 FOR I=1 TO 29
  150 VDU 31,0,I,224,31,39,I,224
  160 S%(I*40)=1:S%(I*40+39)=1
  170 NEXT
  180 FOR I=0 TO 39
  190 S%(I)=1:S%(I+1200)=1
  200 NEXT
  210 FOR I=0 TO lev%
  220 REPEAT
  230 a=RND(36)+1:b=RND(27)+1
  240 UNTIL a<16 OR a>23 OR b<11
 OR b>18
  250 S%(a+b*40)=1:A%(I)=a+b*40:d
e%(I)=1:c=RND(4):B%(I)=1*((c=1)-(
c=2))+40*((c=3)-(c=4))
  260 VDU 31,a,b,36
  270 NEXT
  280 X%=RND(8)+415+RND(8)*40:c=R
ND(4):Z%=1*((c=1)-(c=2))+40*((c=3
)-(c=4))
  290 VDU 31,X%MOD40,X%DIV40,96:S
%(X%)=1
  300 FOR I=112 TO 128 STEP 8
  310 SOUND 1,-1,I,4
  320 NEXT
  330 SOUND 1,-1,80,4:SOUND1,-1,1
00,5
  340 REPEAT UNTIL ADVAL-6=15
  350 REPEAT
  360 TIME=0:H%=INKEY-98-INKEY-67
:V%=40*(INKEY-105-INKEY-73)*(H%=0
):Z%=Z%*-(H%=0ANDV%=0)+H%+V%:X%=X
%+Z%
  370 VDU 31,X%MOD40,X%DIV40,96
  380 IF S%(X%) de%=1 ELSE S%(X%)
=1
  390 FOR I%=0 TO lev%
  400 b%=B%(I%)
  410 IF de%(I%)=0 GOTO 450 ELSE
a%=A%(I%):IF S%(a%+b%) b%=-1:IF S
%(a%+b%) b%=-40:IF S%(a%+b%) b%=1
:IF S%(a%+b%) b%=40:IF S%(a%+b%)
de%(I%)=0:GOTO 450
  420 B%(I%)=b%:a%=a%+b%:A%(I%)=a
%:S%(a%)=1
  430 VDU 31,a%MOD40,a%DIV40,36
  440 IF S%(a%+b%) AND RND(2)=1 b
%=1:IF S%(a%+b%) b%=40:IF S%(a%+b
%) b%=-1:IF S%(a%+b%) b%=-40:IF S
%(a%+b%) de%(I%)=0
  450 B%(I%)=b%
  460 NEXT
  470 fl%=0
  480 FOR I%=0 TO lev%
  490 fl%=fl%+de%(I%)
  500 NEXT
  510 REPEAT UNTIL TIME>12
  520 UNTIL de% OR fl%=0
  530 lev%=lev%+1
  540 UNTIL de% OR lev%=6
  550 IF de%=0 FOR I=140 TO 180 S
TEP 2:SOUND 1,-15,I,1:NEXT:VDU 28
,6,20,33,14,12:PRINT'TAB(8)"WELL
DONE !!"'''" The Dollar is vanquis
hed !"'''" press space to play aga
in";:REPEAT UNTIL INKEY-99:RUN
  560 FOR I=40 TO 10 STEP-2
  570 SOUND 1,-15,I,1
  580 NEXT
  590 VDU 28,10,20,29,14,12
  600 PRINT'" G A M E    O V E R"
'''" The Dollar has won"''TAB(4)"p
ress  space";
  610 REPEAT UNTIL INKEY-99:RUN
```



We interrupt this program to...

Robert Henderson adds another utility to your bulging collection of scrolling routines

OVER the years we have published many scrolling routines – horizontal, vertical, coarse character based and fine pixel scrolling. We thought we had seen them all, but now Robert Henderson has produced yet another variation on the scrolling message theme.

Bigscroll is an extremely fast triple height text scroller that operates under interrupts. This means that no matter what the rest of the program is doing, the text will fly by in its scrolling window at the bottom of the screen.

Two, two-byte pointers hold the address of the message start and end – it can be any length and you're merely restricted by the amount of available memory. The more ram you have the bigger the message you can store. It is poked into memory at the start of the program.

Each character is taken by the routine and the bit pattern is obtained directly from the operating system rom – character definitions are stored from &C000 onwards. Each byte of the character is poked three times into memory to make the print three times higher than normal.

The whole machine code routine is executed under interrupts every time frame flyback occurs. As the code is quite long problems can occur because the micro can spend so much time in the interrupt that the main program can't get a look in and everything grinds to a halt.

To speed up the Electron the ADC is switched off with *FX16 and keyboard processing is suspended with *FX178. This results in a significant saving in time, but at the expense of not being able to use the joystick port or keyboard. A Turbo Electron runs fast enough for these two *FX commands to be omitted.

```
10 REM Bigscroll
20 REM By R.Henderson (
30 REM (c) Electron User
40 MODE 4:*FX16
50 VDU 23,1,0;0;0;0;
60 *FX178
70 PROCread(5)
80 HIMEM=&3000
90 REM Main machine code
100 FOR i%=0 TO 2 STEP 2
110 P%=&900
120 [ OPT i%
130 \ Save registers
140 .jp STA &79:STX &7A
150 STY &7B:CLD
160 .text
170 LDA &71:CMP &77:BEQ lx
180 INC &70:BNE prg
190 INC &71
200 \ Get letter and
210 \ store bit pattern
220 .prg
230 LDY #0:LDA (&70),Y
240 CMP #1:BEQ invon
250 CMP #2:BEQ invoff
260 STA &80:JSR times
270 \ Call scrolling
280 \ subroutines
290 .scsl1
300 JSR scrolling:JSR loop
310 JSR scr:JSR xyz
320 JSR drw:JSR xyz:JSR tblh
330 \ Restore registers
340 \ and quit
350 LDY &7B:LDX &7A
360 LDA &79:RTS
370 \ Scroll the message
380 .xyz
390 LDY #0
400 .loop
410 LDA (&72),Y:STA (&74),Y
420 INY:BNE loop
430 INC &75:INC &73
440 .loop2
450 LDA (&72),Y:STA (&74),Y:INY
460 CPY #&40:BNE loop2
470 RTS
480 \ Checks for end
490 \ of message
500 .lx LDA &70:CMP &76
510 BEQ xl:RTS
520 \ Checks for inverse
530 .invon LDA #&FF:STA &78
540 INC &70:JMP prg
550 .invoff LDA #&0:STA &78
560 INC &70:JMP prg
570 RTS
```

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```
  580 .xl LDA #lo%:STA &70:LDA #h
i%
  590 STA &71:INC &70:JMP prg
  600 .rts RTS
  610 \ Print triple
  620 \ height letter
  630 .tblh
  640 LDA &88:EOR &78:STA &7FFF:S
TA &7FFE:STA &7FFD:LDA &87:EOR &7
8:STA &7FFC
  650 STA &7FFB:STA &7FFA:LDA &86
:EOR &78:STA &7FF9:STA &7FF8
  660 STA &7EBF:LDA &85:EOR &78:S
TA &7EBE:STA &7EBD:STA &7EBC:LDA
&84:EOR &78
  670 STA &7EBB:STA &7EBA:STA &7E
B9:LDA &83:EOR &78:STA &7EB8
  680 STA &7D7F:STA &7D7E:LDA &82
:EOR &78:STA &7D7D:STA &7D7C:STA
&7D7B
  690 LDA &81:EOR &78:STA &7D7A:S
TA &7D79:STA &7D78:RTS
  700 .scrolling
  710 LDA #&7D:STA &75:STA &73
  720 LDA #&78:STA &74
  730 LDA #&80:STA &72:RTS
  740 .drw
  750 LDA #&7E:STA &75:STA &73
  760 LDA #&C0:STA &74
  770 LDA #&C8:STA &72:RTS
  780 .scr
  790 LDA #&7C:STA &75:STA &73
  800 LDA #&40:STA &74:LDA #&48
  810 STA &72:RTS
  820 .times LDA #0:STA &8C
  830 LDA &80:SEC:SBC #32
  840 \ Multiply by 8
  850 STA &8B:CLC:ASL &8B:ROL &8C
  860 ASL &8B:ROL &8C:ASL &8B:ROL
&8C
  870 .scan
  880 \ Get char def
  890 \ from ROM
  900 LDA #0:STA &8E:LDA #&C0:STA
&8F
  910 CLC:LDA &8B:ADC &8E:STA &8E
  920 LDA &8C:ADC &8F:STA &8F
  930 .do LDY #0:LDX #0
  940 .dlp LDA (&8E),Y:STA &81,X
  950 INY:INX:CPX #8:BNE dlp:RTS
  960 :]:NEXT
  970 ?&220=0:?&221=&9:*FX14,4
  980 PRINTTAB(12,14);"SCROLLING
TEXT"
  990 PRINTTAB(17,16);"DEMO"
 1000 *FX15,1
 1010 GCOL 12,1:SOUND 1,1,100,-1:
flg%=0
 1020 REPEAT:FOR li%=464 TO 596 S
TEP 8
 1030 MOVE 0,li%:DRAW 1278,li%
 1040 ENVELOPE 1,1,-1,1,?&240,1,1
,4,0,0,0,0,0,0
 1050 IF INKEY(0)=32 li%=1024:flg
%=1
 1060 NEXT:UNTIL flg%=1
 1070 VDU 7:*FX13,4
 1080 CLS:VDU 23,1,1,0;0;0;0;:END
 1090 DEF PROCread(pointer%)
 1100 start%=&3000:end%=&3200
 1110 lo%=start% MOD 256
 1120 hi%=start% DIV 256
 1130 fi%=end% MOD 256
 1140 sh%=end% DIV 256
 1150 ?&70=lo%:?&71=hi%
 1160 ?&76=fi%:?&77=sh%
 1170 FOR f%=start% TO end%:?f%=3
2:NEXT
 1180 v%=start%
 1190 FOR r%=0 TO pointer%:READ f
$
 1200 FOR mem%=1 TO LEN(f$)
 1210 dat%=v%+mem%
 1220 ?dat%=ASC(MID$(f$,mem%,1))
 1230 NEXT
 1240 v%=v%+(mem%-1)
 1250 NEXT
 1260 REM Poke inverse data
 1270 ?&3182=1:?&3194=2
 1280 ?&78=0
 1290 ENDPROC
 1300 DATA "  As you can see, thi
s is a demonstration of smooth (a
nd fast!) horizontal scrolling...
  "
 1310 DATA "The code works in mod
e 4 only and (at least in theory)
 is able to scroll a message of u
p to 65536 bytes (64k), which is
more space than you are ever like
ly to need... "
 1320 DATA "    You could have sc
rolling messages in high score ta
bles, demos and 1001 other uses..
."
 1330 DATA " It can also display
your message in  "
 1340 DATA "  inverse video...
How about that then ? ... "
 1350 DATA " Type *FX13,4 to stop
 the scrolling...   Thats all fol
ks..."
```


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According to plan

Francis Botto tries to discover how some programmers write such good software

LIKE countless others, I often wonder how certain programmers achieve great success. Is the ability inherent within them before ever they begin programming. Or do they just get lucky. For example, how do they avoid the obstacles that turn into insurmountable problems for others?

The issue is shrouded in yet more mystery when you consider that most gifted programmers can't explain why they are able to program well. It is like music: You occasionally hear of musicians who cannot read music, but they are able to play tunes which make the hairs on the back of your neck stand up.

Certain people find programming second nature. For instance, some don't plan their strategy at all, but simply leap straight in. To the not so gifted this is programming suicide, and it usually leads to one of three outcomes: A program which is not what it could be, a project abandoned or a program structure that cannot be enhanced.

How about you. What do you do first? If you immediately begin programming then you probably assume that you belong to the group which doesn't need flowcharts or a series of steps. However, that assumption might be misguided, as it might just be that you think you are a programmer who belongs to this elitist group, when in fact your work could be greatly improved by some basic preparation.

Amusing thoughts on this subject are expressed by Rodnay Zaks, author of many computer books who wrote: "Ten per cent of the programming population can write a program successfully without having to flowchart. Unfortunately, 90 per cent of the population believes it belongs to this 10 per cent".

Therefore, a staggering 80 per cent of programs are nowhere near what could be described as optimum solutions. It should come as no surprise to hear that the best ones are usually those that emerge from careful planning. Just as you should never go shopping on an empty stomach while on a diet, you should never go programming on an empty head.

To get down to business, imagine you have come up with a program concept. First you should draft a descriptive algorithm which describes what it is to do. For instance, if you were programming an expert shell, you might write: "Program to permit the user to devise expert systems". The more concise it is the better.

Next comes the question: Should you use Basic or assembly language? This can be a difficult decision to make. Of course, you can always opt for a hybrid assembly language/Basic program which is one of the luxuries of the Electron.

If you are writing a program that does not

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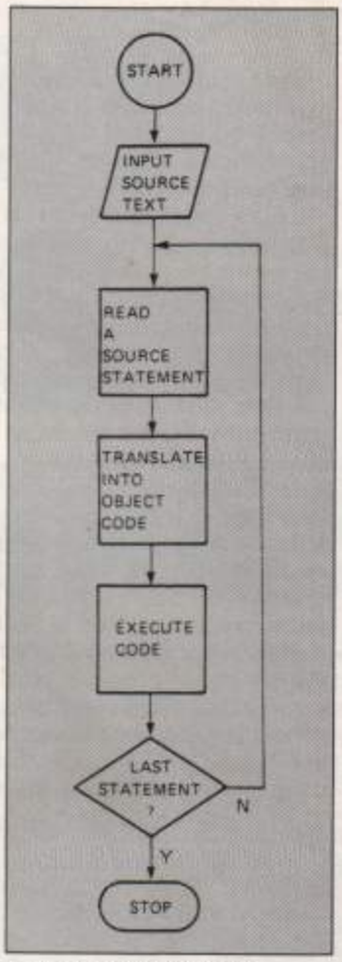
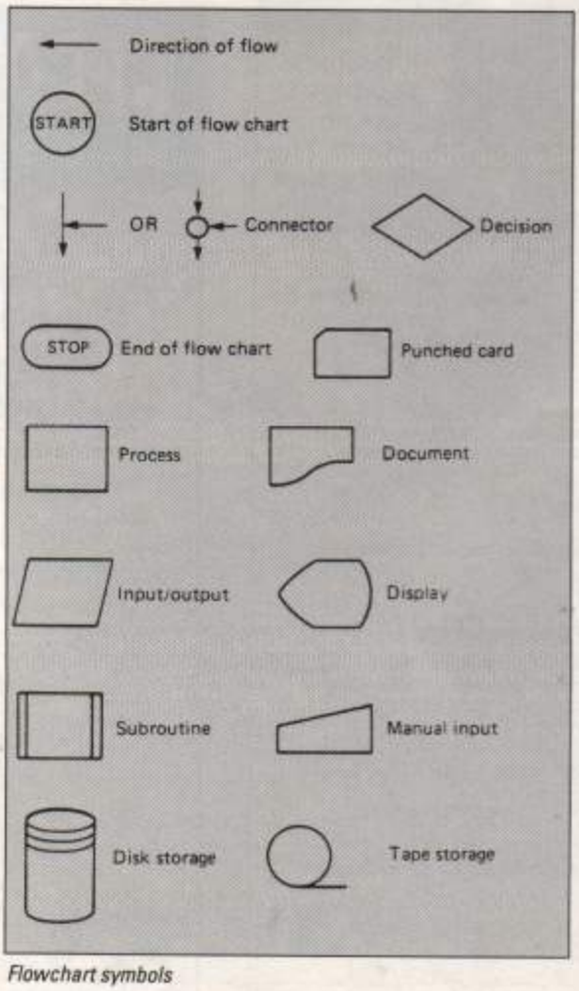
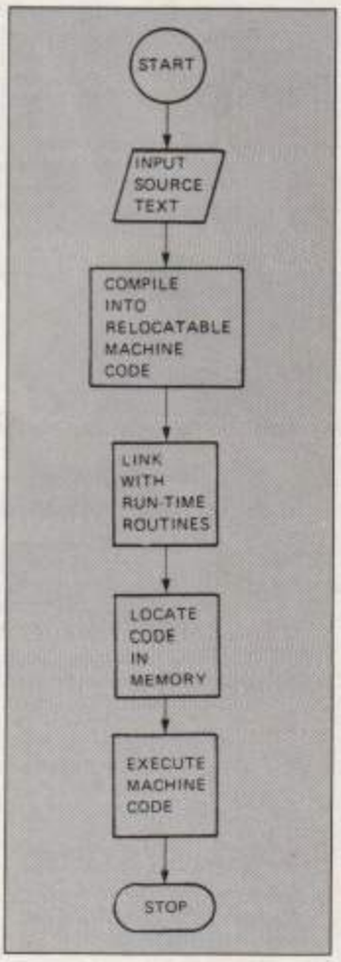


Flowchart for an interpreter



Flowchart symbols



Flowchart for a compiler

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depend upon a high speed of execution, then Basic will do. Alternatively, if high speed is the only route to a satisfactory program solution, you will probably find that you require assembly language.

It is also important to bear in mind your programming strengths and weaknesses. If you are not a fluent assembly language programmer you might find that you can develop an equivalent Basic program in a fraction of the time.

OK, you have a concept, descriptive algorithm and you have decided what language to use. What next? At this stage, a programmer who has not had a misspent period with the anti-structured programming set, which uses GOTOs, GOTOs and GOTOs, will have to decide on one of two approaches: A top down or bottom up analysis.

What is the difference? A top down analysis is simply a method of beginning at a high level and working your way down to the low level program workings. For instance, you might begin by listing all the procedures or subroutines you wish to use and then fill in the gaps, working your way down to low level program statements such as loops, input statements and other commands.

Not surprisingly, a bottom-up analysis is the exact opposite, where you begin with low level workings making your way toward a high level solution. I think a top down analysis is the best approach, often leading to a better program structure, particularly when programming in Basic.

Now it is time to draft either a flowchart or a series of steps. Flowcharts are fine for achieving a high level outline, but the approach can break down when moving toward low level program workings. Using a bottom up analysis is not really practical while flowcharting.

The alternative to the flowchart is a series of steps:

```
PROGRAM Expert shell
A. Procedure: Accept rules
   1. Input rules into array
B.Procedure: Edit knowledge
   1. Pinpoint rule to edit
C. Procedure: Inference engine
   1. Chain rules
D. Procedure: Save knowledge
   1. Open file
   2. Write rules in array
E. Procedure: load Knowledge
   1. List all files if disc
   2. Load rules into array
```

The list is drafted in the classic outline style. When you reach this stage, whether you are using a flowchart or a series of steps, you should pinpoint those parts of the program which appear more than once. You might find that one procedure can replace two or more of the others.

Most programming involves the repetition of the same program excerpts and programmers use the same basic structures. Assembly language is no different: What seems like a long and complex assembly language program will often contain many similar program sections.

The essence of good programming is to minimise the number of program sections which are repeated. That way you will end up with a compact program, save memory space, and achieve the most from the Electron. You can build a library of commonly used routines and merge them into your listing during program development, saving a great deal of time.

You can now begin programming and, if you are new to this planning approach, you will find that things go a lot more smoothly.

Planning and programming skills on their own do not necessarily mean that you will write successful programs – a good idea is required. However, it would be true to say that what should be a good program can be spoiled by a lack of careful planning. Hopefully you will now get down to writing that masterpiece for *Electron User* which you have been putting off for ages.

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Ian Webster dreamed up the superb 3D arcade game that'll have you hooked right from the word go

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THE octopus race is being poisoned by nuclear waste and your task is to enter 10 cities and destroy plutonium balls – deadly pulsating spheres dumped by unscrupulous waste disposal firms – while avoiding the robot guard spheres that protect them.

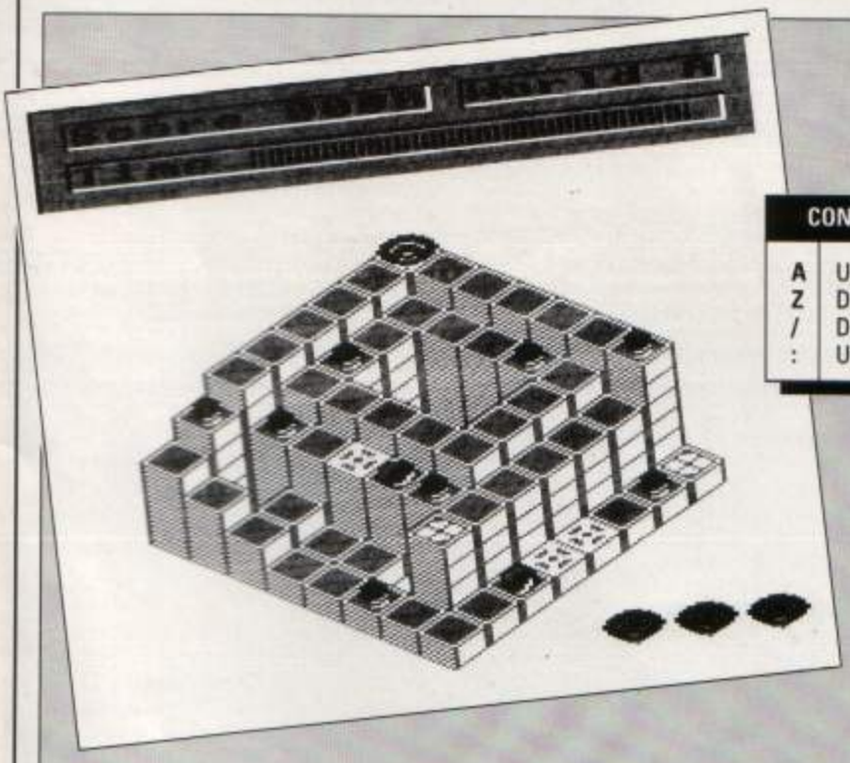
You must beware of dangers below the waves and can jump only small distances – too great a drop and you'll die, or too great a height and you won't be able to climb it. And don't fall off the edge of the city walls or you'll be lost forever.

Help is at hand in the form of transporters and destinators. Stepping on to a transporter will instantly whizz you to a destinator. However, the guards have a Plan B – if you clear all 10 cities of plutonium balls they bring out the spare set and make the cities invisible.

Each city except the first is accessed by a password, and this is given once the level has been completed, so you can restart from the screen you were on last time without having to clear the preceding ones first. There's also a time limit in which to clear each level, so keep one eye on the timer at the top of the screen.

The game is played on a 3D landscape produced using the normal technique of plotting the blocks furthest away from the screen front and working forwards. The blocks are sprites EORed on to the screen, but as colours two and three are both set to the same colour they appear to be masked. This technique saves graphic data and speed.

Final point: Octopuses travel in an odd way. They move in one direction until they hit a barrier, then choose a random direction and carry on.



CONTROLS	
A	Up left
Z	Down left
/	Down Right
:	Up right

```
   10REM Octavia
   20REM By Ian Webster
   30REM (c) Electron User
   40REM Don't Renumber!
   50IF PAGE>&E00 GOTO1590
   60:
   70MODE5:OSCLI"FX4,2":PROCinit:
HI%=100:REPEAT:PROCtpage:PROCgame
:IF S%>HI% HI%=S%
   80UNTILO
   90:
  100DEFPROCrestore(lev):lev=lev
MOD 10:RESTORE(1350+lev*10):ENDPR
OC
  110:
  120DEFPROCgame:OSCLI"FX178":PRO
Ctop:L%=3:PROCcls:S%=0
  130REPEAT:COLOUR129:COLOUR3:PRI
NTTAB(18,1);CHR$(65+level);TAB(1,
3)"Time ";STRING$(13,CHR$224);:GC
OLO,1:MOVE1200,903:DRAW1200,923:P
ROCrestore(level):PROCread:PROCdr
aw:PROCmove:level=level+1:UNTIL L
%=0:OSCLI"FX178,255":COLOUR3
  140COLOUR128:PROCbc("GAME OVER"
,16):TIME=0:REPEATUNTILTIME>300:P
ROCcls:ENDPROC
  150:
  160DEFPROCo(AD,N,T):FORA=1TO N:
READ x,y:X=(y+9)-x:Y=((y+14)+x)-H
(x,y):!&70=X*&10+Y*&140+&5800:!&7
2=AD:CALLsp:G(x,y)=T:IF T=2 G(x,y
)=A+2
  170IF T=3 T(A-1)=x:T1(A-1)=y:G(
x,y)=0
  180NEXT:ENDPROC
  190:
  200DEFPROCded:SOUND1,1,100,6:SO
UND1,1,80,6:SOUND1,1,50,7:a=FNad(
LX,LY):xx=(Y%+9)-X%:yy=((Y%+14)+X
%)-H(LX,LY):b=xx*&10+yy*&140+&580
0:!&70=a:!&72=&4200+lof:CALLsp:!&
70=b:!&72=&4200+of:CALLsp:a=b
  210PROCd25:!&70=a:!&72=&4200+of
:CALLsp
  220!&70=a:!&72=&4180:CALLsp:PRO
Cd25:!&70=a:!&72=&4180:CALLsp:!&7
0=a:!&72=&40C0:CALLsp:PROCd25:!&7
0=a:!&72=&40C0:CALLsp:ENDPROC
  230:
  240DEFPROCw(x,y,x1,y1):x=x*64-8
:y=991-y*32:x1=x1*64+64:y1=1029-y
1*32:GCOL0,0:MOVEx1,y1:DRAWx1,y:D
RAWx,y:GCOL0,3:DRAWx,y1:DRAWx1,y1
:ENDPROC
  250:
  260DEFFNad(x,y):?&60=x:?&61=y:?
&62=H(x,y):CALL&A00:=!&60
  270:
  280DEFPROCsp(AD,x,y):?&60=x:?&6
1=y:?&62=H(x,y):CALL&A00:!&70=!&6
0:!&72=AD:CALLsp:ENDPROC
  290:
  300DEFPROCmove:D%=0:PROClives:X
%=SX%:Y%=SY%:PROCsp(&4200,X%,Y%):
of=0:REPEAT:TIME=0:LT=-100:PROCti
me:REPEAT:LX=X%:LY=Y%:lof=of
  310PROCtime:IF TIME>4000 D%=1:G
OTO490
  320lmf=mf:mf=mf EOR &40:FORm=1T
02:PROCmmon(m):IF (MX(m)=X% AND M
Y(m)=Y%)D%=1
  330NEXT:IF D%=1 GOTO 490
  340IFINKEY-106 T%=TIME:REPEATUN
```

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```
TILINKEY-90:TIME=T%
  350IF INKEY-73 X%=X%-1:of=&40:G
OTO390
  360IF INKEY-105 X%=X%+1:of=0:GO
TO390
  370IF INKEY-98 Y%=Y%+1:of=0:GOT
O390
  380IF INKEY-66 Y%=Y%-1:of=&40
  390PROCtime:IFINKEY-17:*FX210,1
  400IFINKEY-82:*FX210
  410IF LX=X% AND LY=Y% AND lof=o
f UNTILO
  420IFX%<DORX%>70RY%<DORY%>7 D%=
1:GOTO490
  430IF H(X%,Y%)>H(LX,LY) X%=LX:Y
%=LY:IF lof=of UNTILO
  440IF H(LX,LY)-H(X%,Y%)>1 OR H(
X%,Y%)=0 OR TIME>4000 D%=1:GOTO49
0
  450PROCsp(&4200+lof,LX,LY):IF G
(X%,Y%)=1 G(X%,Y%)=0:PROCsp(&40C0
,X%,Y%):SOUND1,1,120,3:S%=S%+10:P
ROCscore:M%=M%-1
  460LX=X%:LY=Y%:lof=of
  470PROCsp(&4200+of,X%,Y%):FORm=
1TO2:IF(X%=MX(m)ANDY%=MY(m))D%=1
  480NEXT:IF D%=0:IF G(X%,Y%)>2 l
of=of:LX=X%:LY=Y%:T=G(X%,Y%)-3:X%
=T(T):Y%=T1(T):PROCtrans
  490UNTIL M%=0 OR D%=1:IF D%=1 P
ROCded:PROCd25:PROCd25:PRINTTAB(1
,3)"Time ";STRING$(13,CHR$224);:L
%=L%-1:PROClives:X%=SX%:Y%=SY%:PR
OCcheck:of=0:PROCsp(&4200,X%,Y%):
GCOL0,1:MOVE1200,903:DRAW1200,923
  500IF D%=0 PROCdoneit
  510D%=0:UNTIL L%=0 OR M%=0:PROC
cls:ENDPROC
  520:
  530DEFPROCtop:VDU28,0,4,19,0,17
,129,12,26:MOVE0,863:DRAW0,1023:D
RAW1279,1023:GCOL0,0:MOVE1279,101
9:DRAW1279,863:PRINTTAB(1,1)"Scor
e 0000"TAB(12,1)"City  A"TAB(1,3)
"Time ";STRING$(13,CHR$224);
  540PROCw(1,1,10,1):PROCw(12,1,1
8,1):PROCw(1,3,18,3):GCOL0,1:MOVE
1200,903:DRAW1200,923:ENDPROC
  550:
  560DEFPROClives:VDU28,14,29,19,
28,17,128,12,17,129,26:IF L%>0 x=
14:y=28:FORa=1TOL%:!&70=x*&10+y*&
140+&5800:!&72=&4200:CALLsp:x=x+2
:NEXT:ENDPROC ELSE ENDPROC
  570:
  580DEFPROCread:READ C,C1:VDU19,
1,(C*ABS(level<10));0;19,2,C1;0;1
9,3,C1;0;:FORY=1TO8:READ A$:FORX=
1 TO 8:H(X-1,Y-1)=VALMID$(A$,X,1)
:G(X-1,Y-1)=0:NEXT,:READ SX%,SY%:
ENDPROC
  590:
  600DEFPROCdraw:FORY=0 TO 7:x=Y+
9:y=Y+13:FORX=0TO7:!&50=x*&10+y*&
140+&5800:?&52=H(X,Y):CALLtower:x
=x-1:y=y+1:NEXT,
  610READ N:M%=N:PROCo(&4DC0,N,1)
:READ N:PROCo(&4100,N,2):PROCo(&4
140,N,3):FORA=1TO2:READ MX(A),MY(
A):md(A)=RND(4):PROCsp(&4180,MX(A
),MY(A)):NEXT:mf=0:ENDPROC
  620:
  630DEFPROCscore:PRINTTAB(7,1);S
TRING$(4-LEN(STR$(S%)),"0");S%:EN
DPROC
  640:
  650DEFPROCtrans:FORA=10DT0200ST
EP10:PROCsp(&4200+lof,LX,LY):SOUN
D1,1,A,1:of=0:PROCsp(&4200,X%,Y%)
:NEXT:ENDPROC
  660:
  670DEFPROCtime:IF TIME-LT<8 END
PROC
  680LT=TIME:Q=TIME/5:GCOL0,1:MOV
E1200-Q,923:DRAW1200-Q,903:MOVE12
08-Q,923:DRAW1208-Q,903:ENDPROC
  690:
  700DEFPROCc(A$,Y):PRINTTAB(10-L
EN(A$)/2,Y);A$;:ENDPROC
  710:
  720DEFPROCbig(A$,X,Y):VDU31,X,Y
:FORA=1TOLEN(A$):?&70=ASC(MID$(A$
,A,1)):X%=&70:Y%=0:A%=&A:CALL&FFF
1:VDU23,255:FORa=&7110&74:VDU?a,?
a:NEXT:VDU255,8,10,23,255:FORa=&7
5TO&78:VDU?a,?a:NEXT:VDU255,11:NE
XT:ENDPROC
  730:
  740DEFPROCbc(A$,Y):PROCbig(A$,1
0-LEN(A$)/2,Y):ENDPROC
  750:
  760DEFPROCdoneit:COLOUR128:COLO
UR3:PROCc("City "+CHR$(65+level),
12):PROCc("Completed",14):COLOUR1
:PROCc("Entering City "+CHR$(66+l
evel),16)
  770IF level<10 COLOUR3:PROCc("Y
our Password is:",18):PROCc(FNup(
level+1),20)
  780FORA=150 TO 200 STEP5:SOUND1
,1,A,1:SOUND1,2,A,1:NEXT:TIME=0:R
EPEATUNTILTIME>300:COLOUR129:COLO
UR3:ENDPROC
  790:
  800DEFPROCd25:FORdel=1TO350:NEX
T:ENDPROC
  810:
  820DEFPROCmmon(A):LOCALx,y:x=MX
(A):y=MY(A):d=md(A):x=x+x(d):y=y+
y(d)
  830IFx<00Rx>70Ry<00Ry>7 PROCrse
t:ENDPROC
  840IF G(x,y)=1 OR ABS(H(MX(A),M
Y(A))-H(x,y))>1 OR H(x,y)=0 PROCr
set:ENDPROC
  850PROCsp(&4180+lmf,MX(A),MY(A)
)
  860MX(A)=x:MY(A)=y:PROCsp(&4180
+mf,x,y)
  870IF RND(8)=1 md(A)=RND(4)
  880ENDPROC
  890:
  900DEFPROCrset:md(A)=RND(4):x=M
X(A):y=MY(A):PROCsp(&4180+lmf,x,y
):PROCsp(&4180+mf,x,y):ENDPROC
  910:
  920DEFPROCcalcmc:FORA=0TO2STEP2
:P%=&A00:[OPT A:LDA&61:ASLA:ASLA:
ASLA:ASLA:STA&61:LDA&60:ASLA:CLC:
ADC&61:TAY:STA&80:LDAtable,Y:STA&
60:LDAtable+1,Y:STA&61:LDX&62:BEQ
fin:.loop:LDA&60:SEC:SBC#64:STA&6
0:LDA&61:SBC#1:STA&61:DEX:BNEloop
  930.fin:LDA#0:STA&62:STA&63:RTS
  940.table:]:FORy=0TO7:FORx=0TO7
:xx=(y+9)-x:yy=((y+14)+x):a=xx*&1
0+yy*&140+&5800:?P%=a:?(P%+1)=a D
IV 256:P%=P%+2:NEXT,:NEXT:ENDPROC
  950:
  960DEFPROCcheck
  970O%=0:FORm=1TO2:IF(SX%=MX(m)A
NDSY%=MY(m))O%=1
  980NEXT:IF O%=1 lmf=mf:mf=mf EO
R &40:FORm=1TO2:PROCmmon(m):NEXT:
GOTO970
  990ENDPROC
 1000:
 1010DEFPROCcls:!&62=&8000:FORa=1
TO8:CALLcls:NEXT:ENDPROC
 1020:
 1030DEFPROCinit:VDU23;8202;0;0;0
;23,224,0,170,170,170,170,170,170
,0:RESTORE1510:FORA=&4000 TO &427
F STEP4:READA$:!A=EVAL("&"+A$):NE
XT
 1040DIM H(7,7),G(7,7),T(10),T1(1
0),MX(2),MY(2),md(2),x(4),y(4):x(
1)=1:x(2)=-1:y(3)=1:y(4)=-1
 1050ENVELOPE1,1,6,4,-5,1,8,5,0,0
,0,0,0,0
 1060ENVELOPE4,2,-5,-3,2,2,4,8,0,
0,0,0,0,0
 1070PROCmc
 1080PROCcalcmc
 1090ENDPROC
 1100:
 1110DEFPROCmc:FORA=0TO2STEP2:P%=
&900:[OPTA
 1120.sp:JSRp:JSRa:.p:LDY#0:.l:LD
A(&70),Y:EOR(&72),Y:STA(&70),Y:IN
Y:CPY#32:BNEl:RTS:.a:LDA&70:CLC:A
DC#64:STA&70:LDA&71:ADC#1:STA&71:
LDA&72:CLC:ADC#&20:STA&72:LDA&73:
ADC#0:STA&73:RTS
 1130.block:LDA#0:STA&72:LDA#&40:
STA&73:STA&75:LDA#&60:STA&74:JSRb
p:JSRba:JSRbp:JSRba:.bp:LDY#0:.l:
LDA(&70),Y:AND(&74),Y:ORA(&72),Y:
STA(&70),Y:INY:CPY#32:BNEl:RTS
 1140.ba:LDA&70:CLC:ADC#64:STA&70
:LDA&71:ADC#1:STA&71:LDA&72:CLC:A
DC#&20:STA&72:LDA&73:ADC#0:STA&73
:LDA&74:CLC:ADC#&20:STA&74:LDA&75
:ADC#0:STA&75:RTS
 1150.tower:LDA&52:BNEok:RTS:.ok:
TAX:.lp:LDA&50:STA&70:LDA&51:STA&
71:JSRblock:LDA&50:SEC:SBC#64:STA
&50:LDA&51:SBC#1:STA&51:DEX:BNElp
:RTS
 1160.cls:LDA#&40:STA&60:LDA#&5E:
STA&61:LDX#34:.l:LDY#0:.l2:LDA(&6
0),Y:AND(&62),Y:STA(&60),Y:INY:BN
El2:INC&61:INC&63:DEX:BNEl:RTS:]:
NEXT:ENDPROC
 1170:
 1180DEFFNcpass(A$):B$="":FORa=1
TO LEN(A$):B$=B$+CHR$(ASC(MID$(A$
,a,1))+3):NEXT:RESTORE1470:a=0:le
vel=0:REPEAT:READ A$:IF A$=B$ lev
el=a
 1190a=a+1:UNTIL a=10:=level
 1200:
 1210DEFFNinput:B$="":REPEAT:A$=G
ET$:IF A$=CHR$127 AND LEN(B$)>0 B
$=LEFT$(B$,LEN(B$)-1):VDU127
 1220IF LEN(B$)<10 AND A$>="A" AN
D A$<="I" B$=B$+A$:PRINT;A$;
 1230UNTIL A$=CHR$13:=B$
 1240:
 1250DEFFNup(l):RESTORE1470:FORa=
1TOl:READ A$:NEXT:B$="":FORa=1 TO
 LEN(A$):B$=B$+CHR$(ASC(MID$(A$,a
,1))-3):NEXT:=B$
 1260:
 1270DEFPROCtpage:VDU26,20,12,19,
1,5;0;:DRAW1279,0:DRAW1279,1023:D
RAW0,1023:DRAW0,0:PROCbc("Octavia
",1):COLOUR1:PROCc("By Ian Webste
r '89",3):COLOUR2:PROCbc("The Cha
racters",4):!&70=&6210:CALLblock:
PROCbig("Block",4,8)
 1280!&70=&65D0:CALLblock:!&70=&6
5D0:!&72=&4100:CALLsp:PROCbig("Te
leport",4,11):!&70=&6990:CALLbloc
k:!&70=&6990:!&72=&4140:CALLsp:PR
OCbig("Destinator",4,14):!&70=&6D
50:!&72=&40C0:CALLsp:PROCbig("Plu
tonium Ball",4,17)
 1290!&70=&6FD0:!&72=&41C0:CALLsp
:PROCbig("Robot",4,19):!&70=&7250
:!&72=&4200:CALLsp:PROCbig("Octav
ia (Hero)",4,21):COLOUR3:PROCbc("
Enter Password",24):PROCc("Return
 for City A",26):COLOUR2:PROCc("H
igh Score :"+STR$(HI%),30):*FX15
 1300VDU31,5,28:COLOUR1:level=FNc
```

```
pass(FNinput):COLOUR3:ENDPROC
 1310:
 1320REM Level data in following
format :
 1330REM col1,col2,grid(x8),xstar
t,ystart,no,gems,no,Trans start,T
rans end,monx,mony(x2)
 1340:
 1350DATA 4,7,66666654,65555403,6
5005422,65005411,65005411,6555540
1,64444441,11111111,0,0,8,6,0,3,1
,5,1,1,4,5,5,7,5,0,6,1,7,3,5,3,3,
7,4,7,0,0,6,6,0,7,4,3,5,7
 1360DATA 5,7,77555101,77005101,6
0005111,50005101,55555101,1111110
1,00110001,11111111,7,0,8,2,0,0,2
,6,2,5,4,0,5,2,5,2,7,7,7,2,5,0,4,
4,0,0,3,0,4,5,3,4
 1370DATA 1,7,77777777,77655331,7
6654331,55554331,54444321,5333332
1,52002221,51001111,0,0,8,1,0,6,0
,6,1,7,1,5,4,1,6,7,6,0,7,2,7,0,4,
7,1,4,2,2,5,0,6,6
 1380DATA 4,6,77777777,76666666,7
6050005,76555554,76050003,7605000
2,76050001,76543211,1,1,9,6,0,4,1
,7,1,1,3,6,3,7,4,0,5,3,6,5,7,1,7,
7,0,0,5,0,3,3
 1390DATA 2,7,77555555,76544441,7
5000041,64100041,63100041,6210004
1,60100031,65100021,0,0,8,1,7,7,0
,2,1,0,3,6,3,1,5,7,6,6,7,3,0,5,7,
5,2,7,1,3,0,7,0,0,4,1,1,3
 1400DATA 1,7,77707777,66066061,5
5505511,40444111,33301111,2221101
1,00111001,11010111,0,0,9,2,2,4,0
,5,2,0,5,3,7,6,1,4,4,7,3,3,1,3,6,
5,2,3,1,4,0,0,7,0,1,7,6,4,4,2
 1410DATA 1,7,07654321,77654321,6
6604321,55050321,44404321,3333332
1,22222221,11111111,7,7,7,4,7,6,2
,5,5,4,1,1,3,2,1,1,1,6,6,3,3,7,7,
1,4,0,1,4,0,7,3,3,3,3,1,0,0,1,4,4
,3,3,4,4,0,3
 1420DATA 5,7,77775555,77775555,7
7775555,77775555,33331111,3333111
1,33331111,33331111,7,0,15,5,4,6,
4,7,4,4,5,5,5,6,5,7,5,4,6,5,6,6,6
,7,6,4,7,5,7,6,7,7,7,8,4,0,6,1,5,
1,5,3,0,4,2,5,3,4,3,6,0,0,1,0,0,7
,0,1,3,3,3,2,2,3,4,4,5,3,3,4
 1430DATA 2,7,77777707,60000000,5
5555555,00000004,33333333,2000000
0,10110111,11001101,5,0,7,0,0,0,2
,3,2,7,3,2,4,6,6,3,6,5,4,2,6,4,7,
4,5,7,7,7,3,4,6,2,5,6,7,0,2,6,7,0
,5,2
 1440DATA 4,7,77777777,76666666,7
6555555,76544444,76543333,7654322
2,76543210,76543201,0,0,11,7,0,0,
7,4,1,5,4,2,6,4,4,7,5,6,6,2,3,2,2
,4,2,9,7,3,6,3,5,3,4,3,3,3,3,4,3,
5,3,6,3,7,7,7,7,7,7,7,4,7,7,7,7
,7,7,7,7,7,7,5,5,6,6
 1450:
 1460REM Passwords
 1470DATA LVDDF,DVLPRY,SUHOXGH,IR
XQGDWLRQ,KDUL,VHOGRQ,KHOLFRQ,WUDQ
WRU,URERW,GDGHHO
 1480:
 1490:
 1500REM Sprite data
 1510DATA0,B050201,B050201,F0F0F0
7,D0A0408,F0F0F0E,0,D0A0408,D0A0D
0B,D0A0D0A,70F0F0F,50A050B,E0F0F0
F,8040A0D,9050B0D,1010101,102050A
,0,50A050A,102050A,8080808,80C0AD
9,8040201,0,FFFFFFFF,88CCEE,88CCE
E
 1515DATA 0,113377,0,FFFFFFFF,113
377,0,0,0,0,0,0,0,0
 1520DATAEECC8800,FFFFFFFF,0,EECC
8800,0,77331100,77331100,FFFFFFFF
,0,0,77331100,77FFFF77,EECC8800,C
EFFFFEE,0,0,0,0,1112377,0,C8E4EAE
,0
 1530DATA0,0,0,03010000,3010000,E
030905,C080000,70C090A,0,C080000,
103,0,509030E,103,A090C07,80C,80C
,0,0,1000000
 1540DATA0,E0D0303,0,70B0C0C,0,80
00000,1,0,3030D0E,0,C0C0B07,0,8,0
,0,11110000,44330000,7733BB99,EEC
C0000,EFFFFFFF,0,88880000,11,0,67
FFFFFF,33,2E9FDFCF,CC,88,0,0,0,44
663311,FFFFBB99,EE66CC88,0FFFFFFF
,0,0,0,0,7777FFFF,1123,2EAE9FDF
 1550DATA884C,0,0,33110000,337777
33,CFFFFF33,8F7F5FBF,3FFFFFCC,1FE
FAFDF,CC880000,CCEEEECC,1133,0,37
EFCFFF,3,CE7F3FFF,80C,88CC,0,3311
0000,33777733,FFFFFF33,FFFFFFFF,F
FFFFFCC,EFFFFFFF,CC880000,4C6E6EC
C,1133,0,37EFFFFF,3,CE3F9FCF,80C,
88CC,0
 1560:
 1570REM Downloader
 1580*FX18
 1590PRINT"Downloading Software.
Please Wait."''
 1600*KEY0 *T.|MD%=PAGE-&E00:FORI
%=PAGE TO TOP STEP4:!(I%-D%)=!I%:
NEXT:PAGE=&E00:!(TOP-D%)=&FF0D|MO
LD|MRUN|M
 1610*FX138,0,128
 1620END
```


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Large files can be split across several disks, and recombined. As much as possible of the computer's memory is used for copying files, including unused parts of shadow screen memory, sideways ram banks (inc. AP7), ram cartridges (inc. ABR (32K) and AQR (256K)), tube memory (up to 61K), B+ paged ram (12K) and unused parts of the Slogger Master Ramboard (Electron).
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Heading for the century

Tony Leah reporting from one of the most successful Electron software companies

FOR six years the name Superior Software has stood for quality and quantity in the Electron games marketplace – a sector of UK computing that hasn't been overblessed with choice in entertainment, particularly in recent times.

Surprising, therefore, that the software house that has supported the Electron since the machine's earliest days has never been paid its due in a computer magazine until now.

While packing for his firm's recent relocation from Leeds to Brigg in South Humberside, managing director Richard Hanson found time to talk about Superior Software's history and its plans for the future. The company's long absence from the computer media spotlight may be explained by Richard Hanson's quiet personality and the fact that he likes his products to speak for themselves.

Richard and Steve Hanson

Games tester David Blackburn checks out Network by Peter Scott for inclusion in a new Electron compilation

Few *Electron User* readers can be unaware of the enormous range of titles that Superior has issued for their machine – starting with Centibug in 1983 and running through to this year's Christmas releases.

The number of games to come from the Superior Software stable is now approaching the 100 mark – most of them available for the Electron. It's a total that would have been unthinkable when Richard Hanson began programming on the Acorn Atom 10 years ago.

He first became involved with computers during a mathematics degree course at Leeds University in the late 1970s. By the end of his first year he realised micros had become more interesting to him than figures, and he switched to a course in computer science, learning languages like Basic, Algol and Fortran before graduating with a BSc.

The university didn't have any personal computers in those days, so to further his new-found hobby of programming, Richard bought himself an Acorn Atom.

The machine had just been launched and Richard describes it as "the best cheap computer around at that time – certainly it was the most useful, as the Sinclair machines with their tacky keyboards were very limited in their performance".

Richard wrote about 20 programs on the Atom – all eventually published by Micropower – ranging from a space invaders game, which was the first thing he had written in machine code, to a home budgets program and a star-tracking program for amateur astronomers.

When the BBC Micro arrived on the scene Richard wrote a further six Micropower programs of various types for the new machine, among them World Geography, which until very recently was still earning him royalties.

In mid-1982, at the end of his degree course, Richard decided to set up a partnership with fellow Micropower author John Dyson and Superior Software was born. By the autumn of 1982 the pair had released their first four products – Galaxy Birds, Space Fighter and Centibug written by Richard and Invaders written by John.

"It went very nicely right from the start", recalls Richard. "We had each put in £50 to start the company and I think we'd only spent about £20 of it before the money from sales started to roll in".

In 1983 came Alien Dropout and Road Racer from Richard, Froggy and Hunchback from John. Early releases typically sold

about 6 to 7,000 copies, but Hunchback – with sales to date of 26,000 – propelled Superior into the forefront of BBC Micro software suppliers.

The arrival soon afterwards of the Electron sparked a feverish burst of activity as the firm's BBC Micro games were converted to run on the exciting new machine.

It is worth recording that a notable exception to conversion of the BBC Micro software stock was Road Racer, due largely to hardware scrolling limitations which ended hopes of several existing games being converted for the Electron. "Road Racer is an example of a game that was never converted. It could have been with a lot of effort, but it would have meant restructuring it and not using the hardware scrolling", said Richard.

"But by and large the games that could be were converted very simply, very few changes needing to be made. They tended to fall into one of two categories, those you could convert easily and those you couldn't without a lot of effort".

As a result of this, several games in addition to Road Racer that might have been popular with owners of the new machine didn't receive the Electron treatment. "At that time we weren't sure if it was worth the investment, and by the time the machine had established itself the games were too old to convert", said Richard.

In the event Centibug became the first Electron conversion, closely followed by Alien Dropout, Invaders and Fruit Machine which was the first game written for Superior Software by an outsider.

Because Richard Hanson retained the rights to non-BBC Micro versions of the Micropower products World Geography, Constellation and and Disassembler, these were also converted for the Electron.

Also in the shops around this time was Overdrive, a car racing simulation for the BBC Micro written by Peter Johnson and later converted for the Electron. It was destined to become Superior's most successful game with nearly 40,000 copies sold across both BBC Micro and Electron versions.

Interestingly the Electron version of Overdrive eventually outsold the BBC Micro version by more than two to one. Richard Hanson explains: "I think the main reason was that it was until recently the only racing car game for the Electron whereas it had a lot of competition in the BBC Micro sector".

In fact Overdrive very nearly missed being an Electron best-seller. "It took a great deal of persuasion to get Peter Johnson to perform the conversion", recalls Richard Hanson. "Yet it was a very simple job – probably only about a day's work – and with royalties from Electron version sales of around 28,000 he did very nicely out of it in the end".

Towards the close of 1983 business had grown to such an extent that more hands were needed at the pump. John Dyson, unwilling to leave his job as a technician with BBC TV Leeds, was bought out and Richard's older brother Steve – a globe-trotting food scientist up until that time – joined the firm. His arrival marked the start of a period of major expansion for Superior Software, a move into new premises – Richard and John had been running the business from their own homes – and ongoing success in the Electron marketplace.

During its long history Superior has occasionally dipped its toe in the water of other computer makes – though never to any great effect. Its first attempt to break out of the BBC/Electron market came at the end of 1984 when seven titles were released for the C64.

"They didn't sell particularly well", said Richard. "We did a little better the next time around, and some of our releases for other machines have done quite nicely while others have not been so well received. Overall there has been little encouragement to move our major effort away from the Acorn marketplace".

Tempest, released for the BBC Micro and Electron early in 1985, is regarded as something of a milestone for Superior because for the first time it inspired full page, four colour advertising. And it marked the point when the price of Superior games for the Electron went up for the first time – from £7.95 to £9.95.

In the summer of the same year came Repton, another tremendous success, swiftly followed by Deathstar. Christmas saw the release of Repton 2, Citadel and the software synthesiser program, Speech.

With sales of 35,000, Repton 2 is the best-selling of the famous series of captivating reptilian adventures. Counting Repton 3 and the three sets of additional screens, the series has so far notched up total sales of 120,000.

Mid-1986 saw another major event take place – an agreement with Acorn to take over publication of Acornsoft games titles. These included the mega hit Elite – which has since enjoyed sales of 17,500 in its Superior Software version – a repackaged Revs including Revs 4 Tracks, and two Acornsoft Hits compilations.

Christmas that year marked the release of Repton 3, Ravenskull and Strykers Run. "Although Repton 3 did not sell as well as its immediate predecessor, all three titles were big successes which helped us to expand the company further", said Richard.

At the start of 1987 Superior produced the

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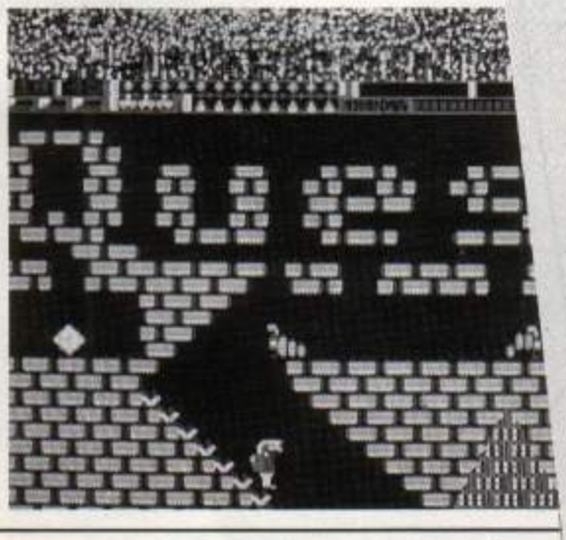

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first three of its famous Superior Collection series – two for the BBC Micro and one for the Electron.

"It was a year for consolidating our success", said Richard Hanson. "One notable event, however, was our first game for the Archimedes – Zarch by Elite co-author David Braben, the most skilful author I've ever come across".

Christmas saw the release of Life of Repton and the first Play It Again Sam compilation, both hits.

"Since the start, the Sam series compilations have always contained four titles, initially our own but more recently including games from other software houses", said Richard. "Play It Again Sam has been a great success story – we're now up to version 10 with versions 11 and 12 lined up for release before Christmas this year".

However, Richard Hanson notes that Electron disc version sales have not always come up to expectations. "Superior Collection 3 and the first Play It Again Sam have been the only Electron disc products that have sold really well", he said.

Last year Superior broke more new ground, for the first time approaching a third party developer for the rights to license a title. The result was a BBC Micro and Electron version of Palace Software's hit release Barbarian, followed soon afterwards by Last Ninja from Activision and A Question of Sport from Elite Systems.

"The move into licensing has been a success", said Richard, "though it hasn't always been plain sailing. We also tried to get permission from US Gold to produce a BBC Micro and Electron version of Outrun but couldn't pull off the deal. We'd love to produce many more conversions under licence like Barbarian and Last Ninja and the reason why we haven't done so is not for the want of trying on our part".

Superior's biggest sellers at Christmas were Exile – the result of a two-year project by Jeremy Smith and Peter Irvin – and Last Ninja.

During 1989 Superior has been busily adding to its Play It Again Sam series, as well as releasing licensed titles Barbarian II from Palace Software, Predator from Activision and Ballistix from Psygnosis. "In fact Superior Soccer, which has only just been released, is our first original program in quite a while and we expect it to do very well", said Richard. "This isn't the result of any deliberate policy – it's just the way things have fallen into place this year".

Superior produced some titles for the Master Compact as part of its original deal with Acorn, its products since Repton have been BBC Master compatible, and it has since gone on to release programs for the Archimedes. "Sales of our Archimedes products have not been good overall, Zarch being the exception", said Richard. "Conqueror and Archimedes Repton 3 have been disappointing when compared to the sales we've achieved for BBC Micro and Electron games.

Has Superior ever considered producing "serious" software for the Electron? "Not really", says Richard. "Our experience is with games, a sector of the marketplace which is still very profitable for us, so there is no great urge to branch out into unknown territory.

"Having said that, we have just formed a second company called Superior Microcomputing which may lead to other projects within the computer field.

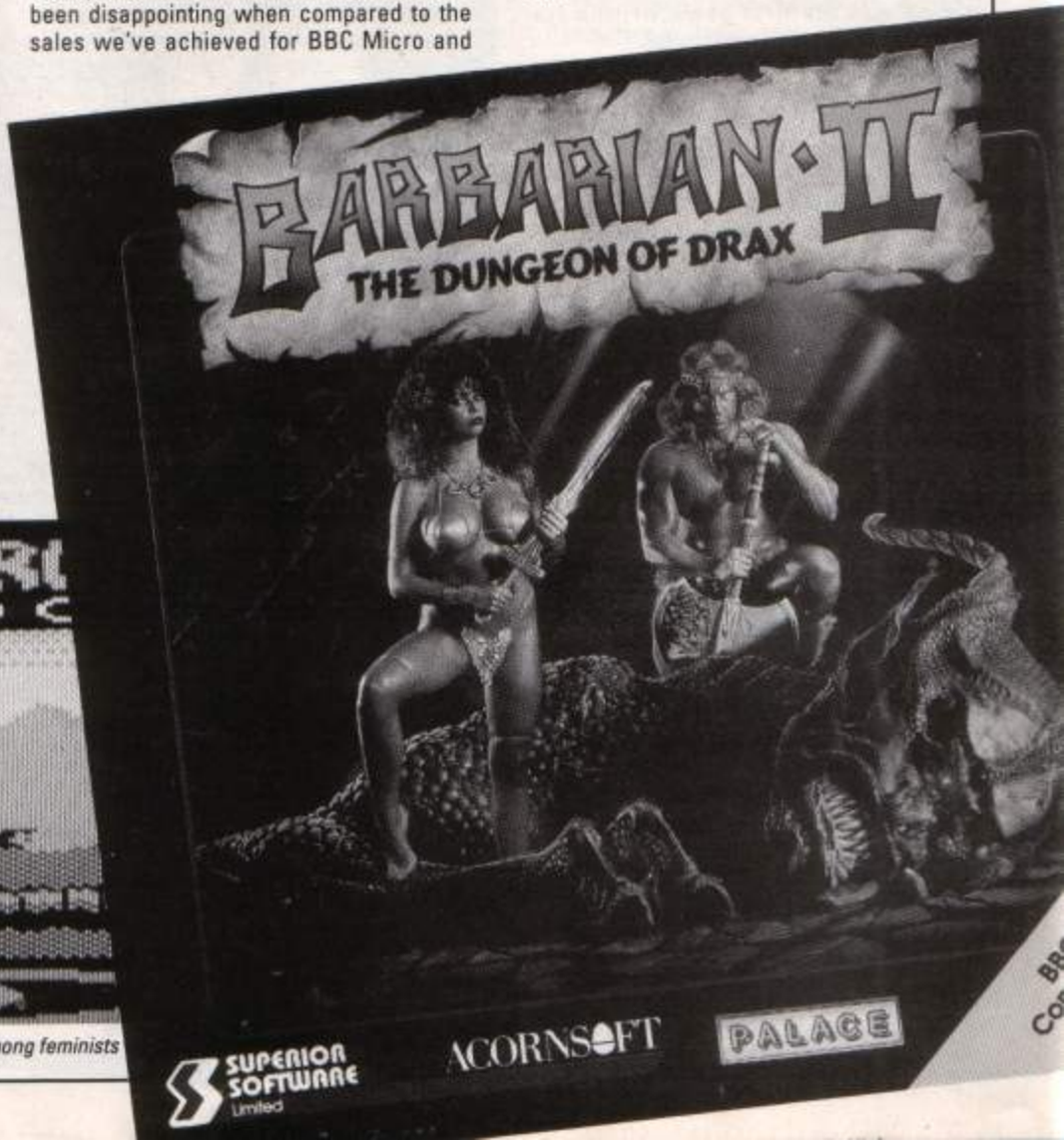
"Although our software sales have gradually declined over the past year or two from their peak, it has been a slow decline and nothing either sudden or damaging has taken place.

"There remains an enormous BBC Micro and Electron user base and I feel there is still the market to sell up to 30,000 copies of a really good product. Even during the past two years sales of our best titles have topped 20,000.

"We've dabbled with software for Amstrad, Commodore, Spectrum and Amiga machines, but the Acorn market remains the best for us.

"Our commitment to it will be seen again this Christmas by which time we'll have Superior Soccer and at least two other original games in the shops. I don't even contemplate a day when Superior Software doesn't have at least three or four new Electron games in the pipeline – if that day ever comes I'm sure it will be a long way off".

Scantily clad Maria Whittaker caused an uprour among feminists



Always read the fine print

Howard Roberts advises on how to choose the printer best suited for your particular purpose

THE second peripheral many Electron users will consider buying to upgrade their system is a printer. The first, of course, is a Plus 1, without which you can't use a printer. Now the range of printers available for home computer systems is vast and rather daunting.

What I aim to do is not to decide which one is best for all Electron users – that would be impossible with the enormous range of applications for which the micro is being used – but to help you decide which one is best for you.

Printers fall into two main categories, the impact and image varieties. These are split into further subgroups, each having different methods of output.

Dot matrix printers: These produce an image on the paper by imposing a sequence of dots made by small pins in the printhead which are fired forward into a ribbon by a small magnetic field.

When the pins strike the ribbon they leave marks on the paper. The pins are usually arranged in one of two configurations: Nine pins arranged vertically, or 24 pins arranged in two offset lines of 12. With 24 pins packed into the same space as nine, you get much better quality and definition.

Within the dot matrix printer market one manufacturer, Epson, has set an industry standard all others have to follow if their product is to be successful. Therefore most printers are either Epson FX (nine pin) or Epson LQ (24 pin) compatible.

Daisywheel printers: Each character has a place on a "petal" attached to a central hub – hence the daisy name. When the printer is turned on it finds a reference point and is then able to work out where each letter is on the wheel.

When the printer receives a letter from the computer it turns the wheel to the correct point and a hammer pushes the petal into the ribbon, leaving an impression on the paper.

Daisywheel printers also have an industry standard to which they should conform – Diablo 630.

Image printers: These work in a completely different way to their impact cousins, building up the page in ram before transferring it to the paper. They are often referred to as page printers because they can only print a page at a time. Such machines are almost exclusively of the laser variety and are beyond the Electron's scope.

Two new types of printer are slowly edging their way into the market, the inkjet and liquid crystal machines.

Inkjet printers such as the Hewlett-Packard Deskjet or the Integrex Colourjet 132 work by heating up a nozzle which then fires a spot of ink at the paper.

They are still new on the market and as yet conform to no obvious standard. I have come across inkjets that emulate Epson, Hewlett-Packard and IBM printers and some that use their own codes.

Liquid crystal printers are at the forefront of technology and borrow heavily from that used in their laser brothers. Again they are really beyond the Electron's scope.

When choosing a printer the first question to ask yourself is "What am I going to use it for?"

Make a list of "musts", include things like quality of print, output speed and price. Look at the pros and cons of each type below and see which one matches your requirements most closely.

Dot matrix and inkjet

For: Fairly cheap, versatile, can print text or graphics with equal ease, very common so virtually all software can drive them, available in wide carriage versions, moderately fast at low quality output, wide range of font sizes and styles, can use continuous or single sheets of paper, colour printing available.

Against: Noisy, text and graphics of poor quality compared to laser printers, very slow when outputting graphics, feeders for single sheets are extra, software drivers for

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colour and 24 pin printers very rare, areas of black or colour on paper can leave large amount of wet ink which can bleed or crinkle the paper.

Daisywheel

For: Superb quality text, sometimes better than laser printers, wide range of daisywheels containing typestyles, cheapest way to get high quality text, can use cut sheet or continuous stationery.
Against: Extremely noisy, very slow, change of font or typeface available only through changing daisywheel, if petals on wheel is damaged whole wheel must be replaced, cut sheet feeders costly and virtually a necessity for long unattended print runs, incapable of printing graphics, colour not available except for very few models.

Running costs

As well as thinking about what type of printer to buy, pay some consideration to what you will have to do once you've got it. Will it be expensive to run? Are ribbons widely available? How much do extras like sheet feeders and font cartridges cost? Will software you buy in the future be capable of driving it?

For impact printers you have to think of consumables like ribbons and sheet feeders. There are basically two types of ribbon, nylon and carbon. When a pin or a daisywheel petal hits a nylon ribbon it tends to splat slightly giving the letter a very slightly ragged edge. With a carbon ribbon the image is clean cut.

With a sheet feeder – used mainly for extended mailshots – you have to find out how many sheets it can hold, whether it can cope with envelopes or whether you have to print labels and stick them on the envelopes later.

Also consider whether it is easy to change the ribbons. Is there an authorised dealer near you who will be able to repair the printer?

What is the manufacturer's reliability record? Is the manual translated properly or is it Japlish?

Finally we come to which type of printer is best for you. I have listed some of the major applications of the Electron and the types of printer best suited:

Word processing: If you just use your word processor to knock off a quick letter to a friend or a magazine then a dot matrix printer with an NLQ (near letter quality) or LQ (letter quality) option will be quite good enough.

If however, you need mailshots or regularly write important documents, you should definitely consider a daisywheel printer.

Spreadsheets: Spreadsheets often contain huge swathes of figures and the only way to print them is to use a very small font on a very wide piece of paper. If you require this and a facility to print graphs from your figures, you should look at dot matrix.

If presentation is important look for a laser printer with the ability to print a very small font in landscape.

Painting packages: If your pictures include colour and you want a true representation there is really only one choice and that is dot matrix.

Colour inkjet drivers are virtually non-existent in the most popular art packages. However this may change as more people buy this sort of machine.

If you require high quality output you should seriously consider a good 24 pin dot matrix printer with a wide carriage.

Accounts: All the accounts packages I have seen use predesigned continuous stationery for use with a dot matrix or daisywheel printer.

Programming: If you are a programmer and need a listing of your program you want it as quickly as possible. You don't need high quality and you want it all in one long listing and not on separate sheets. Have a look at dot matrix printers capable of high speeds using continuous stationery.

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Every month *The Micro User* keeps you in touch with the latest developments in the ever-growing world of Acorn micros. This colourful and informative magazine is packed with articles, type-in programs, definitive reviews and up-to-the-minute news covering the entire BBC Micro and Archimedes range. Whether you intend to upgrade to another Acorn machine or stick with your Electron, there's something in here for you – many of the programs and reviews are suitable for the Electron. With a subscription you can choose to receive a tape or disc (5.25in or 3.5in) which includes all the major listings.

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MICRO MESSAGES

No joystick for an Aviator

AS a subscriber to your excellent magazine, a veteran Electron user and add-on collector, I am turning to you in the hope that you will be able to help me solve a problem that has had me baffled for months. My Electron is fitted with a Slogger Master Ram Board and it was my good fortune to come across Acornsoft's Aviator in a sale recently.

The program runs perfectly in Turbo mode yet it paints a distracting flashing cursor on the screen while the game is running. Worse still, the toggle between keyboard and joystick is the Tab key, which is not present on the Electron. Nothing I have yet tried succeeds in selecting the joystick option.

I can live with the flashing cursor but would enjoy the game a whole lot more if I could use the joystick. How can this be done? – **Ewan Haggarty, Locking, Weston-Super-Mare.**

● Pressing Control+I generates the same Ascii code as the BBC Micro's Tab key, so if the program is using INKEY$ to read the keyboard you should be able to select the joysticks. However, if a negative INKEY is used to test for the Tab key then there isn't any way round the problem and you're stuck with the keyboard.

...or for the Elite player

I HAVE a Commander 3 interface with utility tape for Atari type joystick but my Quickshot 2 joystick will not work with Elite.

I was wondering if you could tell me if there is any way I can use my joystick with this game? – **Ian Robinson, Stoke-on-Trent, Staffordshire.**

● Unfortunately, Elite can't be made to work with joysticks.

Upgrading in style

MY trusty four-year-old Electron has only just been expanded. Until now it has seen only a small collection of games played with a Quickshot 2 joystick through a Bud F-Byte interface. Both have passed their peak and so I have upgraded in style.

My new set-up includes a Rombox Plus with Slogger's printer and Stargraph roms, the expansion rom 2.0, Panasonic KX-P1081 printer (recommended by you) and Slogger's joystick interface with a clear Competition Pro joystick.

The only product which hasn't thoroughly pleased me has been the joystick interface. This hasn't worked with as many games as I thought it would. I knew there would be some that didn't work, but some of my favourites, Bugblaster, Last Ninja, Beach Head and Way of the Exploding Fist among many others, just didnt load. Could you please tell me why? – **Lawrence Dean, Birmingham.**

● Most games aren't designed to work with joysticks, so the majority of interfaces require a software patch to be loaded before running the game. Some games use all the available memory and crash when they overwrite the joystick code, others reset the keyboard vector which is intercepted by the joystick software, so disabling it.

Steve Davis speaks up

I HAVE just read your review of Play it Again Sam 9. You say that there is no sound on Steve Davis' Snooker. On my version if you press S, hey presto, the sound comes on. – **Lee Sowden, Tiverton, Devon.**

Set up to go for a scroll

I WAS gobbling my daily dose of sweets in my local newsagent and there on the shelf was the amazing Electron User *magazine. It has the power to keep me reading for hours – it has the best game reviews and is the best magazine ever. I think that's enough grovelling, so I'll get to the point.*

I enjoy programming on the Electron. I'm writing games all the time but there are always little details I can't put into my programs to polish them up. Firstly, how do you get messages to scroll neatly across the screen?

Is it possible to have a scrolling screen, if so how? What is the best way to create a well detailed still picture like on title pages? And finally, is it possible to use more than the 32 character squares available. – **Tom Muschamd, Old Down, Tockington, Avon.**

● Many scrolling routines have been published over the past few years. The most recent was Paul Clarke's in our January 1989 issue which demonstrated how to scroll the screen one pixel at a time. Here is a short routine to scroll text across the screen:

```
10 REM Text Scroller
20 MODE 6
30 PRINT TAB(0,5);
40 INPUT "Enter message:"m$
50 VDU 23,1,0;0;0;0;
60 m$=STRING$(20," ")+m$
70 REPEAT
80 PRINT TAB(0,10);m$
90 t$=LEFT$(m$,1)
00 m$=MID$(m$,2)+t$
10 UNTIL 0
```

Pictures and title screens can be created using an art package such as Elkpaint published in last month's *Electron User*.

We're not sure what you mean by being able to use more than the 32 character squares available. Do you mean user defined characters? There is normally a limit of 32, but you can increase this with *FX20.

Unfortunately, this uses quite a lot of memory and if you want to completely redefine the character set with *FX20,6 you'll have to increase PAGE by &600.

Playing with the jet set

WE bought Jet Set Willy from a market and played it many times. Loading was no problem. We stopped using the computer completely over the summer and when I loaded Jet Set Willy after the summer it wouldn't load. I've tried lots of times, even using dif-

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◄ From Page 41

ferent tape recorders, but every time it reaches 4C on the screen 4D appears next to it and then up comes the dreaded words Data? Rewind tape.

Please can you help me? – **Andy Duncan, Camberley, Surrey.**

● Normally when games won't load simply adjusting the tone and volume controls cures the problem. However, in your case, it sounds as though the tape has developed a fault. Contact the software company producing the game and ask for a replacement. There may be a small charge.

Pen pals please

IT is about three years since I bought my Acorn Electron in Ulm – about half way between Munich and Stuttgart, West Germany.

It was one of the last machines sold. Until now it has been impossible to find any other Electron computer user in Germany – the salesman in the computer shop in Ulm didn't have any addresses.

I am now searching for an English Electron user who would like to help me solve my computer problems and improve my English. I will try to help with their problems and if you know a little German I will help with that too. – **Oliver Debus, Muehlberg 18, D-8871 Harthousen, West Germany.**

★ ★ ★

I HAVE been reading your magazine for more than three years and I would like to congratulate you for producing an excellent publication.

I own an Electron with an Advanced Plus 1 Advanced Plus 3 and View word processor cartridge. I also have the Arcade Game Creator on 3.5in disc and many games on cassette.

My hobby is computer programming and I would like to contact Electron users who understand assembly language programming and machine code. – **Paul Mathews, Rydal, Coronation Road, Rodborough, Stroud, Gloucestershire.**

Pascal turns up at a show

I READ with interest D. Auderson's letter in July's issue of Electron User *concerning the search for a Pascal cartridge. I am currently using Turbo Pascal at college and wanted a version of Pascal to use at home.*

I have not found the complete ISO-Pascal Acornsoft package, but at a recent computer show – which contained the odd item relevent to the Electron user – we picked up the main manual from one stand and the two rom chips from Slogger for £7.50 each. So it should be possible to get the two chips and a blank cartridge without too much trouble.

Is there anyone who, like me, feels that the Music 5000 system should be opened up to the rest of the music world by a Midi interface? If so please write to Hybrid Technology or Pres and let them know. – **Ralph Swallow, Southampton.**

All programs printed in this issue are exact reproductions of listings taken from running programs which have been thoroughly tested.

However, on the very rare occasions that mistakes may occur corrections will be published as a program they will almost certainly be the result of your own typing mistakes.

Unfortunately we can no longer answer personal programming queries concerning these mistakes. Of course, letters about suggested errors will be investigated without delay, but any replies found necessary will only appear in the mail pages.

Mysterious symbol

I WOULD be grateful if you could answer the following query: You published a simple tape to disc copying program in the September 1989 issue.

Could you please tell me what the symbol on line 150 is? It is the eighth symbol from the end, in between STR$ and (1&3BE). – **Christopher Boots, Whyteleafe, Surrey.**

● The character is a tilde and is obtained by pressing Control and the left cursor key at the same time. It is used to force the Electron to output numbers in hexadecimal rather than decimal.

No disc upgrades

I HAVE exactly the same problem as J. Nunn (September 1989) with 5.25in discs. In answer to his query, no, the Impact Software discs are not upgraded versions. I bought Play it Again Sam 1 and experienced exactly the same problems as him.

I sent the disc back to Impact who kindly gave me a voucher as a replacement. Will the discs being brought out by Pres work on my set-up? I have an Electron with Rombox Plus, Pegasus 400 disc system, T2P3, MP-135 printer, NTQ and View.

In the September 1989 issue, A.R. Dunks wrote to Micro Messages with some improvements for Home Finance Manager. Although it looks much better, I cannot get a hard copy on the printer, although I could before I added the improvements. Any suggestions?

The August issue included a program for chemical equations. It is excellent but the Oxidation Reduction Reaction:

```
Fe3O2 + CO —> Fe + CO2
```

has the wrong answer. It should be:

```
Fe3O2 + 2CO —> 3Fe + 2CO2
```

Thanks for a great magazine – and now also tape, which is very useful. Keep up the good work. I like the Adventures and Micro Messages pages best. – **Steven Coultas, Grimsby, South Humberside.**

● Home Finance Manager should still print out after the amendments. Check that you haven't accidentally deleted line 620, as this switches the printer on.

We have sent Julie Boswell back to school to brush up on her chemical equations.

The game discs from Pres should work on your system, but we can't say for sure until we have tried them – they are still being written.

Treasurer troubles

I HAVE fairly recently become the owner of an Electron with Slogger 64k Master Ram Board, Plus 1 and Plus 3 with 3.5in single sided disc drive. I am trying to improve the word processor output for my retirement jobs as a secretary/treasurer in charities.

When I realised the printer driver program by Ian Brown published in the August 1986 issue of Electron User *was for a Centronics GLP printer, as mine is, I thought it would be the answer to my prayers.*

Unfortunately, highlights 130 and 134 – italics and Elite print – do not work and there appear to be no appropriate codes in the command summary list in the printer manual.

Is there any way I can overcome this? Will an alternative setting of any of the DIP switch SW2 settings help? These are set as shown in the manual apart from number 2-7, the carriage return.

The fact that these highlights are not available to me are the least of my troubles. Why did Ian Brown have to use the pound sign for the pad character facility? Secretaries, especially treasurers, need that pound sign frequently, so please will you publish an amendment to allow it to be printed. – **M.A. Spencer, Bristol.**

● You should be able to print in italic and Elite type styles using the listing as published. Please check lines 790 and 830 carefully. You can alter the pad character by changing the 96 in line 530. Replace it with the Ascii code of a character not often used, dollar perhaps?

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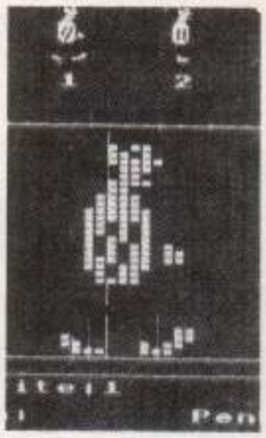

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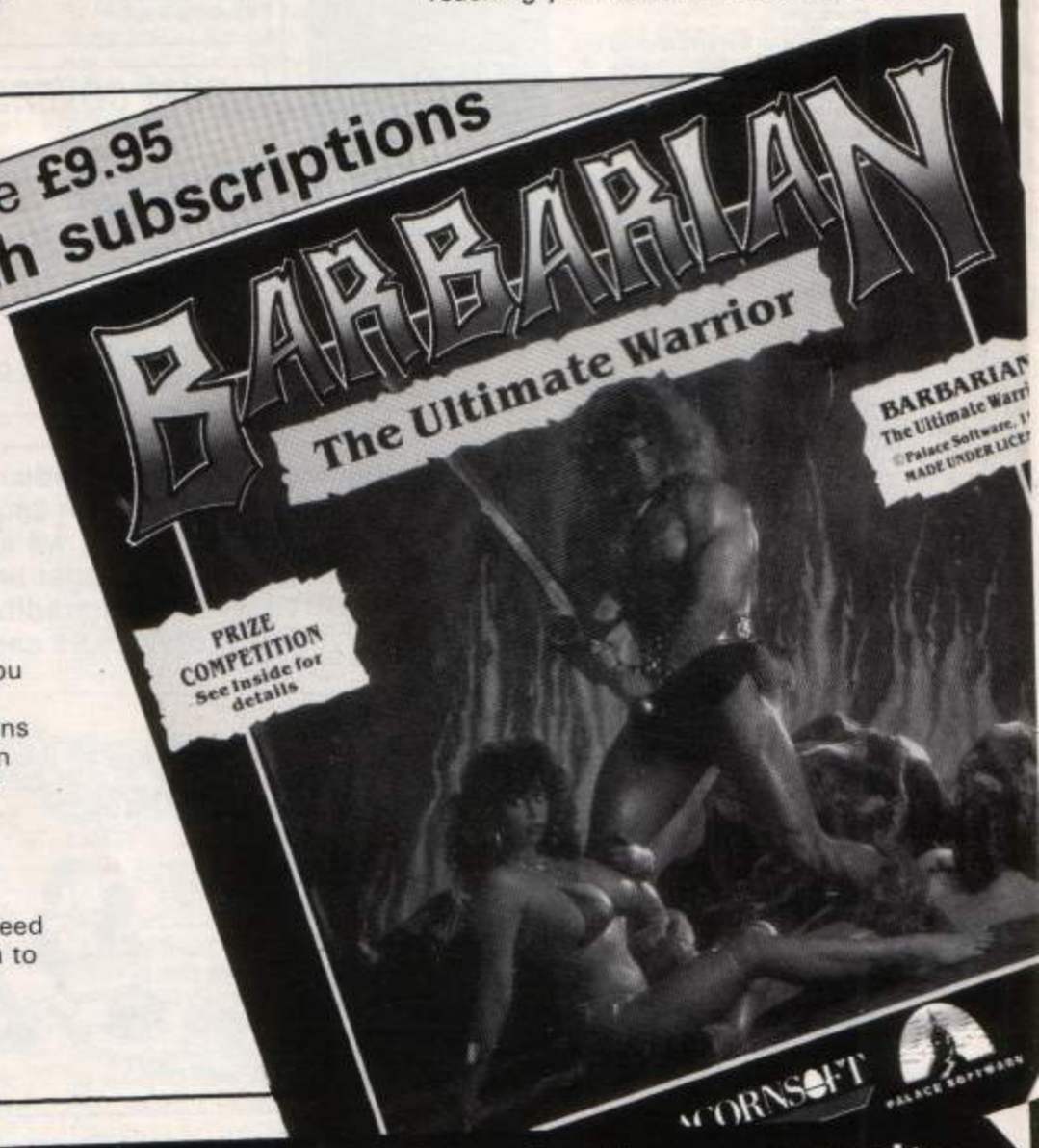

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